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Berninger

A Study of Preferences of Pupils for High School Subjects in Relation to the Factors Chiefly Conditioning the Preferences, and in Relation to the Pupils' Achievment in the Subjects

A STUDY OF PREFERENCES OF PUPILS FOR HIGH SCHOOL SUBJECTS IN RELATION TO THE FACTORS CHIEFLY CONDITIONING THE PREFERENCES, AND IN RELATION TO THE PUPILS' ACHIEVEMENT IN THE SUBJECTS

BY

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THESIS

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CHAPTER I

Introduction and Discussion of the Problem.

It is the intention in this thesis to investigate the preferences of secondary school pupils for their subjects of study in order to understand more clearly what factors determine the preferences and to see what relation, if any, there is between preference and achievement.

A study[1] of the distribution of preferences of pupils for their school studies has been made elsewhere. The questions raised in the present study regarding preference are in some respects the same as those in the former investigation. For example, each inquiry has sought to gather from the replies of pupils data from which generalizations could be made regarding the following:

Are the reasons for preference intelligently assigned to the subjects ranked in order of preference?

How do boys and girls compare in the reasons they give for preference?

Are some subjects always ranked high and others always low?

What subjects stand thus contrasted?

What factors influence preference most?

In particular, the present investigation seeks to find how permanent the preferences are, and whether a considerable degree of relation exists between them and achievement. School

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[1] J. C. Brown and J. H. Minnick: A Study of the Preferences of Secondary School Pupils for the Various Subjects and of the Ranking of those Subjects on the Basis of Utility as Judged by the Pupil. - Journal of Educational Administration and Supervision, October and November, 1915.

marks are assumed as the index of achievement. The extent to which the difficulty of the subject influences the preference has also been investigated. This, together with the usefulness attributed to a subject has usually been considered as having much to do with shaping the preferences of pupils for the subjects of study in high school, and consequently, with their accomplishing the work. Both difficulty and utility have been considered here with a view to finding how they influence preference.

The idea prevails quite generally that achievement in school subjects stands in a direct relation to the interest of the pupil; that electives offer greater likelihood of stimulating interest and attaining a high degree of achievement; that, at certain stages of progress in school, the subjects that offer more direct approach to the trades -- industrial subjects, let us say -- afford better opportunity for discovery of pupils' aptitudes and potentialities than do the cultural, or traditional ones -- the academic subjects. The subsequent realization of the pupils' interests and capacities are -- if this be true -- predicted with a greater surety from the fact that they are engaged in the studies for which they express an interest.

It cannot be admitted that these opinions are entirely true, certainly, it might well be questioned whether the conditions as stated do foster interest and forecast results as is claimed. To magnify interest alone to such a degree seems to put too much of a premium upon it. If a pupil's statement of preference should mean, for example, only a premature decision regarding a study, one based in transitory, undirected impulse, or one which is merely that of least resistance to obstacles, then interest, or preference

is probably entirely lacking in the power to bring about successful achievement.

But to consider a preference which comes to exist as the result of concentration of attention, exercise of discrimination, duration of experience, and systematic application of generalizations is to consider an interest that is significant. This is the kind we should wish to recognize in pupils' reactions to their studies, whether elective or prescribed, whether to subjects giving special training, or those whose chief contribution is along general lines. This is an interest upon which one might safely predict a fair measure of achievement. The extent to which interest is an index to achievement for a common good is traceable through its relation to capacity, which Thorndike[1] says is best indicated by the symptoms of interest, and most satisfactorily put to the test in situations where interest has designated the course of action. There is more weight to be attached to a pupil's failure in a subject where he, by his act of selection, or statement of preference, assumes some responsibility for the result than in one imposed by the administration of the school.

There is room for conjecture whether or not among the recognizable influences the teacher and the method rather than other factors determine the preferences of pupils; whether or not preference is a variable, dependent on time spent in school, on the influence of members of the family or of classmates or acquaintances; whether or not the difficulty of the subject bears a direct relation to the preference for the subject. If any of

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[1] E. L. Thorndike, Education, Chap. 8. p. 139.

these can be found to influence the preference to a definite degree, that discovery ought to be of service in organizing and administering curricula and courses and in coöperating with parents and organizations affiliated with the school in working out pupils' interests to a desirable end. If, on the other hand, there is no appreciable relation between the factors which are believed to be causes for preference and preference itself, we must look elsewhere for reasons which will account for the interests that impel pupils to successful attainment in their studies.

One cannot eliminate from preference a certain amount of like or dislike: interest at least has so much of feeling in it. It is better to reckon with these elements together with the factors conditioning them. It is to the point, then, to see what pupils mean by their reports of preferences and to find what they give as the reasons for them. It is worth while to know how much analysis they can or will give when they assign a preference to a given study, and how stable that preference is.

Difficulties beset one, it is true, in defining preference. One is quite aware of the difference between what pupils say about it and a scientific method -- if that is possible -- of determining its nature and limits. We have no scale to measure it; the most direct source is the explanations of the pupils. When a large number of pupils repeatedly give the same reasons for their interest or lack of interest in a study, their statements take on a considerable degree of reliability. They show conditions as they are. Theories or practices that may result from consideration of their statements about their studies are not ill-founded. Whatever preference should mean, it does mean, at any rate, something upon which they have a

definite opinion, whether they can put it into words or not. An inventory of pupils' reports of preference will suggest what can be utilized and passed on as information about their interests. It will show their aspirations and beliefs of how they will be benefited by what the school has to offer. When their judgments of the worth of the subjects to them are verified by correspondingly high grades, we may suspect that we have found another means of predicating progress in mastery of school studies.

If, however, reports of preference are not sufficiently reasoned out, they furnish small degree of dependence. This might indicate to teachers that there is a field for working with the pupils in preparatory discussion and enlightenment on the opportunities in the various studies. It might also mean greater care in advising pupils in choice of subjects. A plan of acquainting pupils with what have been the experiences of other pupils in certain studies -- what they have thought and felt about them, and with what results -- would be profitable just as plans for vocational enlightenment are. It is not the purpose to discuss such plans here even if they should appear advisable.

That pupils are susceptible to instruction regarding the possibilities in vocations has been proven. Miss Greany[1] has conducted an experiment of this sort with eighth-grade pupils with commendable results. That such a focusing of attention upon the subjects of study and upon desirable combinations of studies could be brought about is quite possible and would make more worth while

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[1] Ellen M. Greany: Vocational Guidance of Grammar School Pupils. Educational Administration and Supervision. March, 1915.

the estimates put upon them by those who are to study the subjects. It would tend to a permanence of preference which would guarantee greater continuity in allied subjects instead of a scattering over this or that which offers attractions of immediate value only. It would not need to interfere with free choice of subjects, but would make that choice more intelligent, and a subject less likely to be discarded in a short time for another only to be regarded in the same way.

In one school included in this study a certain stability of preference is evident. This is perhaps due to a "follow-up" plan in use there, -- a plan which is probably reflected in a disposition to weigh carefully the entire school work and to select and put before the pupils specific values to be derived from the various studies. With such a practice, it seems that one might expect preferences from pupils to be reasoned out more specifically, and their progress in school work to be accompanied or even determined by a greater amount of independence. It is obvious that values of studies should be estimated[1] carefully if representations of them are to be made to pupils in order to help them to adapt their preferences to what the school has to offer. It is also clear that pupils should be brought to want the right things and to know how to realize these wants by the mastery of their studies. A study of preferences as they are is a beginning at finding out what pupils want, and why certain studies satisfy these wants.

Just as there is a need of establishing the factors usually entering into preference in order to know the conditions under which pupils are ranking their subjects of study, so, too,

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[1] E. L. Thorndike: Education. Ch. 7, pp. 121-126.

there is need of agreeing on what is a creditable achievement. The marks assigned by teachers are used here as the indication of achievement; whether this is to be regarded as high or low cannot be ascertained except by an inquiry into the marking systems of the various schools. This inquiry has not been made. Any conclusion regarding the relation between high or low in preference and high or low in achievement will be made by reference to the central tendency of the various groups in the various studies of the schools used in the investigation.

As to utility, -- the fact that a large per cent of pupils explain their preferences in terms of utility may not mean that use is accurately construed, but it is as they see it. Perhaps it is part of the work of teaching to help the pupil to discover utility of the right kind in the subjects of study. If judgments of utility are made on insufficient or wrong basis, teaching has yet to find what it may do to make these judgments more reliable.

A large part of the work of this thesis, then, has to do with establishing preference as a factor really in existence in the work of the high school pupils. It is to be reckoned with, then, and any relation it may bear to achievement is made the more clear by a knowledge of the factors on which it is based.

With a view to finding what pupils in high schools say when asked to rank their school studies in preference, utility, and difficulty, and what reliability or permanence is to be found in these reports of preference, questionnaires were submitted in six high schools in Illinois. In these the pupils were asked to make these rankings and give their reasons for doing so. They were

also asked to tell whether they had changed preferences during their high school work and what reasons led them to change. The returns from these pupils have been presented here with the intention either of corroborating the beliefs already held regarding these factors in secondary school work, of adding to previous studies along a similar line, or of showing any profitable outcome from a better understanding of pupils' interests and the relation of these interests to progress in school work.

A STUDY OF PREFERENCES OF PUPILS FOR HIGH-SCHOOL SUBJECTS IN RELATION TO THEIR ACHIEVEMENT IN THOSE SUBJECTS AND TO THEIR JUDGMENT REGARDING THE UTILITY OF THE SUBJECTS

Name (Boy or Girl) ____________ Month, day, year of birth ______

School ________ Year of H.S. _____ Month and year of entrance ______

In the spaces below check (x) the schools completed by each member of your family; if not completed, state the number of years spent in that school.

	Father	Mother	Older brothers and sisters								
Grade schools											
High school											
College or university											
Special schools											

Name below under Program the subjects you are taking this semester

Program	I	II	III	IV

In column I, mark the most difficult one A; the next B; and so on to the one least difficult.
In column II, mark with a U the subjects that you think will be most useful after leaving school and college; the next in usefulness with a V; and the next, W, and so on to the least useful.
In column III, mark your first preference 1; your next, 2; and so on to the one preferred least.
In column IV, give your reasons for your preferences.
If you have changed your preference since entering high school write on the line below what was formerly your 1st preference; next your 2nd preference, and so on to the one preferred least.

1 ________ 2 ________ 3 ________ 4 ________ 5 ________

If you have changed your preference, check the cause of the change in the list below; if the cause is not found there, add it to the list.

Your family
Your teachers
Your acquaintances
The use you will make of the subject

____

____

____

____

CHAPTER II

Method of Securing and Interpreting Material.

Any study intending to deal with preference and its relation to achievement must deal with a group of pupils sufficiently large and sufficiently representative of prevailing conditions to permit generalization. In order to secure a large number and a fair geographical distribution, questionnaires were used in this study. The questionnaires were given to pupils in six schools and 1410 replies were secured. These were the high schools of Bushnell, Murphysboro, Olney, Salem, Springfield, and Urbana, - all in Illinois. They ranged from an enrollment of slightly more than 100 to 1500 or more. They offer curricula ranging from 1 to 15 in number, and varying from the college-preparatory type, with an attempt here and there at offering some commercial subjects, to those which are considerably differentiated, not only in aim but in time spent in high school and in the organization in the subjects offered. The replies in the questionnaires are thus drawn from a wide range of studies and this results in a wide distribution of preferences with few cases in some of the subjects. Accordingly, for the purpose in this study, only those subjects common to the largest number of pupils have been considered. The questionnaire as used in the majority of the schools is given on the page preceding the beginning of this chapter.

This questionnaire shows some items not used in the study. They were included so as to secure all the information having a possible bearing on the problem rather than to discover too late that certain data were wanted but were then inaccessible. For example, the item, schooling of family might have been of much

value if many pupils had said their families had been a cause in the change of preference. As it turned out, few named this as a reason for change, and, accordingly, no use has been made of it here, beyond mere mention. Another item, month and year of entrance was included in case the factor of length of time spent in school should be used in connection with preference, or achievement, or both. This, too, has not been used in the thesis.

The inquiry was carried on with the questionnaires in the form shown here in all the schools but one, -- Urbana, designated here as school U. This was the first school where the investigation was made and at this time, it had been thought best not to require reasons for preference to be given, as the number of analyses the pupils would be required to make would discourage them from the attempt. But the bare statement of preference without the reason prompting it did not, upon later consideration, seem sufficient basis for interpretation, and a place was provided for the explanations of the preferences on the blanks used with the remaining schools. Later, from school U, however, these data were secured from a number of pupils who were furnishing material for another study and who were included in this one. Fortunately, almost half of those taking part in answering this questionnaire were able to be gotten, although not all that number could be brought to the point of expressing a reason for all of their preferences. Such as did so, gave a markedly personal touch to the information, and as such, it is quite as valuable as if it had been secured in the original expression of preference. This has been explained in the following chapter.

The replies were gotten in person from two of the schools,

Urbana and Springfield. These are the ones which contributed the majority of the replies used, or 860 pupils out of the 1410. In the remaining schools, Bushnell, Murphysboro, Olney, and Salem, the superintendent or principal conducted the inquiry. Precaution was taken where this was so carried on to make the conditions as nearly uniform as possible. Very detailed directions for using the questionnaire were sent with it. In each case the superintendent or principal was intimately known, and known to be interested in the problem and in furnishing accurate information. It was urged that teachers should not superintend the answering of the blanks so as not to lead any pupil to reply in terms that he might consider gratifying to the teacher in charge. The pupils were to be assured that this was not in the nature of an examination, and were to be urged to answer exactly as they felt about their studies, and not to be influenced by the way a classmate might answer or even to pretend reasons which they did not have. That some pupils were over anxious to do what was asked for regardless of whether they had actual reasons, had been observed in giving the questionnaires in the first school; this particularly was not desirable and "manufactured" reasons were subsequently discouraged by taking care to explain that the blanks would be valuable just to the degree that they represented the actual conditions influencing the pupils. After a careful explanation of the printed sheet, each pupil was to be given one and allowed sufficient time to fill out the spaces. Help was not to be given except by explanations whose purpose was to make the meaning of items clear to the pupils; no influence was to be brought to bear on any pupil by way of shaping his answer. With such explanations as these it was thought the conditions could

be kept uniform. The readiness with which the superintendents agreed to conduct this was especially acceptable.

After the data were collected, the grades of these pupils were gotten from the school records. This was also furnished by the superintendents in four of the schools; in the two referred to before, the marks were gotten in person. It was not possible to secure grades for all the pupils, since withdrawals and incomplete records reduced the number considerably below that which represents the preferences.

The method of handling the data was as follows: each individual's statement regarding preference and utility, and preference and difficulty in each subject he was taking was tabulated by classes, boys and girls separately. This would afford opportunity for investigation of marked changes throughout four years of high school work, or for any differences of sex. Correlations were figured where the number of cases and the character of the distribution admitted of a reliable coefficient. These were calculated by the Pearson formula, $r = \cos \frac{\sqrt{bc}}{\sqrt{ad} + \sqrt{bc}}\pi$ Diagrams were used in other instances. All of these were arranged in frequency tables. Per cents were calculated of all preferences given, from "preferred most" to "preferred least" in each subject.

It was the intention originally to take into account and present the rank of each subject on basis of either first or last in preference, or on basis of an intermediate preference, but that was given up when the tendency to ranking the subjects was seen to conform quite generally to that which had been made in Brown and Minnick's study. The subjects were ranked on basis of per cents of pupils naming them first in preference and the positions of the

various subjects in this ranking were noted as high or low. Some of these about which we commonly speculate have been singled out and commented on in the following chapters. The questions arising about them, such as what use there is in Algebra for girls, or how boys regard foreign language; how much a subject giving general training is held in esteem by the pupils -- all these are involved. Again, it is not the purpose here to answer all the problems of which glimpses are given. That is neither possible nor to the point. They intrude, however, at many places in the study and it is a temptation to mention them.

The pupils' interests as disclosed in their reasons for preference were classified as nearly as they could be under chosen headings, and the number under each represented in per cents of the entire number assigning reasons for preference.

The permanence of interests or preference was taken into account by finding what per cent in each school, boys and girls taken separately, had changed in first preference. The per cent of those who had changed in other preferences than the first was also found; in short, the whole number having undergone a change in preference. An idea of permanence of one group was gotten through comparison of their choices on the questionnaire with those given by interview to another experimenter. In addition, a small number of judgments, 120 in all, were secured a second time from three schools, the pupils answering the same things about the same subjects of study after a lapse of a year. These replies have been tabulated and arranged in diagrams so as to show the amount of agreement between the rankings made a year apart. These show quite a degree of consistency and tend to strengthen the belief that

pupils have a considerable definiteness in stating their preferences. They certainly show that there is a permanence of preference, greater than has been attributed to them.

Cause of change of preference were noted under the classifications suggested in the questionnaire, viz., family, teachers, acquaintances, use to be made of the subject. These were recorded and the cause most often named was selected as the representative one. Use of the subject was named as a cause of change by the greatest number of pupils. This was estimated in terms of per cent of the entire number stating reasons for change. The results are given in chapter three. It may be noted in this connection that so small a number of pupils gave their family, or their acquaintances as influences in preference that it is not worth while to take them into consideration. It seems likely from a consideration of conditions in some of the schools that where the teaching force is permanent, greater permanence of preference is shown. This opinion, however, is not borne out by any extended examination of the schools used in the study.

School grades, which have been assumed as the representative of achievement, were ranked and arranged in tables of distribution in which each rank of school marks was arrayed against its corresponding preference. The method of determining the degree of relationship was by the method of contingency[1], a method by which qualitative measurements, such as rankings, may be handled. This admits of a degree of association rather than correlation but can be relied on to show relationship between two characteristics of

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[1] G. M. Whipple. Manual of Mental and Social Measurements, p. 47.

this sort. No probable error has been computed. It is not often computed with this method since the computation is intricate, and probably does not add enough to the validity of the result to justify the computation. It is fair to say it may be large, especially where the frequency tables have few cases and are scattered.

Some comparison has been made of the distribution of cases in what is here called first in Grade Rank in a given subject. For example, by representing the cases above and below the median preference for a number of pupils who are in the first Grade Rank in English, and comparing them with the number in the same Grade Rank who are above and below the median grade, one may get an idea of the closeness of relation between highest in preference and highest in achievement. Correlation or association coefficients are given in subjects where the number of cases have made it advisable to calculate them and comparisons of achievement have been made in subjects selected from the programs of study of the various schools.

The results established by statistics and diagrams have been checked as carefully as possible to avoid error. It is needless to say that an absolutely accurate statement of the relation between preference and its factors, or between preference and achievement would involve the most painstaking examination of the conditions peculiar to each school. The tendency of so large a number of cases as is used in this study offers a basis for later comparisons. That is all that can be attempted here.

CHAPTER III

The Investigation of the Factors Conditioning Preference

This chapter is intended to show the tendencies toward preference for subjects in the different schools investigated, and the degree to which preference is intelligently reasoned out by the pupils. It is the purpose also to show how permanent the preference is and how consistent the pupils are in estimating the usefulness and difficulty in studies.

A loose classification of the reasons for preference has been made in order to find what underlies the majority of replies. Some reports were incapable of classification and were not taken into account. Some were intelligent reasons but could not be satisfactorily placed under the proposed headings. These were called "Miscellaneous" and were such as follows: "Interested in German because my family is of German descent and I want to speak it", "Took new life this semester, and understand the work better" (Shorthand), "Subject (Latin) difficult, but it gives a feeling of pleasure", "I sympathize with the allies" (German, 4th preference out of five subjects), "Definiteness in the subject" (Geometry).

Some pupils made no attempt to give a reason for preference. To show what proportion of pupils will give voluntarily an intelligent analysis of their attitude toward their studies, a count has been kept of the number of studies each pupil was taking and, admitting that a reason could be given for the order of preference in each instance, a comparison of the number has been made with the number of replies actually secured. Some pupils will reply for one or two of the subjects and go no further, either not having any further discriminations to make, or not caring enough

Comparison by classes of possible and actual number of analyses of preferences:

		No.	Possible number of replies.	Actual number of replies	Number making no replies.	Number making one reply only.
I.	Boys	52	249	157	6	5
	Girls	61	286	218	11	1
II.	Boys	119	569	344	29	12
	Girls	92	436	277	20	8
III.	Boys	64	304	212	13	4
	Girls	75	361	240	13	6
IV.	Boys	42	194	124	9	4
	Girls	48	218	139	8	7

Out of these intelligible answers a classification was made and the number answering in terms of such was placed under each. These different heads were: (1) Content of subject, (2) Training or skill, (3) Special interest, (4) General attitude of interestedness or disinterestedness, (5) Method of teaching and teacher, (6) Use or need, including academic value, (7) Difficulty, (8) Ease in understanding, (9) Miscellaneous, (10) Credit or required subject. From a total of 837 intelligible answers by boys and 874 by girls, the chief tendency shows itself to be to answer either in terms of use, or in a general indiscriminating way which has here been termed a general attitude of interestedness or disinterestedness. As illustrations of the answers and their classification, the following are given:-

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Content, or information about the subject.

"For the working out of the experiments and the study of plants." - Botany
"To know the structure of the body." - Physiology.
"To learn about one's country." - History.
"It gives a knowledge of how things are made." - Physics.

Training or skill.

"Makes one accurate." - Algebra.
"For the training of hand and brain." - Mechanical Drawing.
"Taught me skill in getting things for myself." - Zoology.
"It helps one to reason." - Geometry.
"Concentration of mind." - Shorthand.
"Trains my appreciation." - Drawing.
"It will enable me to speak fluently on the history of other countries." - Mediaeval and Modern History.
"Good mind training." - Latin.

Special interest.

"Because I intend to study pharmacy." - Latin.
"I may become an artist." - Freehand Drawing.
"Going to study kindergarten work." - Drawing.
"Mechanically inclined." - Forge work.
"Because I like Architecture." - Freehand Drawing.
"Just naturally liked it." - General Science.
"For newspaper work." - English.

General interestedness or disinterestedness, like or dislike.

"Could not get interested in some books." - English.
"It is fun." - Mechanical Drawing.
"Too dry." - English.
"Interesting and likable." - English.
"Because I disliked the subject after trying it for some time, - teacher, a minor reason." - Journalism.
"Dry and uninteresting." - Latin.
"Nearly all of it uninteresting." - English.
"Tedious." - Shorthand.
"It is fascinating." - Art Metal.
"Appeals to me most." - English.
"Because I like it and it is interesting." - History.
"I never did like it." - Physiology.
"Interesting, not dry." - Public Speaking.
"No interest in it." - Geometry.
"Because it is so interesting." - Physics.
"It is dull." - Sewing.
"Simply because I like it best." - Domestic Art.
"Don't like all the work." - Zoology.
"I don't see anything to it." - Algebra.

Method and teacher.

"The way it is taught."
"Hate it - I only like the teacher." - Latin
"The teacher made it harder than it really was." - General Science
"I have a grand teacher in it." - English.

Use or need, including academic value.
"Placed music last, not that I don't like it, but it will not aid materially in business." - Music.
"Useful to go abroad." - German.
"Don't see why it is good, unless you want to use it to teach." - General Science.
"A language most useful in South America." - French.
"Practicability." - German.
"I never could see where it would be useful." - Algebra.
"To help in English." - Latin.
"Not much use unless you are a contractor." - Geometry.
"Business value." - Commercial Arithmetic.
"Useful in finding meaning of unknown words." - Latin.
"For its value in Agriculture." - Botany.
"Will need to speak it." - German.
"Don't see what use it would be to a girl." - Physics.
"Have found no use to apply it." - Greek History.
"Necessary for beginners." - Geometry.

Difficulty.
"Too complicated." - Algebra and Zoology.
"Very hard." - German.
"Very difficult." - German.
"Hard to understand." - German.
"Too difficult." - Latin.
"Originals too hard for me." - Geometry.
"Hard to pronounce and spell." - German.
"It is hard to learn poems, etc." - English.

Ease in Understanding.
"Too easy." - Geometry and Public Speaking.
"Because it comes the easiest." - Bench Work.

Credits, or Required Work.
"Took it because I had to." - Algebra.
"Need it to graduate." - English.
"Required subject." - General Science.
"For college credit." - Geometry.

Miscellaneous.
"Perhaps because it is so definite - I don't know." - Geometry.
"Music always seemed to soothe my feelings when something was wrong." - Music.
"Its influence on me." - Latin.
"I can do it, but it doesn't fit me." - Bookkeeping.

That some subjects have had their use impressed more than others is obvious. Where choice is in an indirect ratio to the estimate of usefulness, it is likely that teaching has not been able to overcome inherent difficulties in the subject, or the distaste for it. English furnishes an illustration of this, especially

in the junior and senior years; American history shares something of the same fate. Algebra and Geometry are quite commonly regarded as "brain developers", begetting power to think, training the mind, and giving accuracy. At a further point in the discussion of preferences, an effort will be made to show the relation of preference and utility, and to indicate their status in some subjects as they continue from year to year.

The graphical representation following shows the distribution of the reasons assigned in school S_2, both for boys and for girls. That is, the first two columns show that 8.4% of the reasons for preference capable of classification from the boys' answers were in terms of content, and 6.8% of the reasons assigned by the girls. Similarly, 9.7% of the reasons given by boys and 5.6% of those given by girls were in terms of training, or skill which they believed they received from the subject. From this school, girls cite more reasons colored by a special interest or aptitude than do boys, and at the same time, a larger number than the boys give an unanalyzed estimate of their choice of subjects, or adhere more to the mere feeling for or against the subject. The tendency in each of these instances coincides rather closely with the conclusions made in the Springfield survey[1] regarding occupational choices of girls. From the survey, girls' choices seemed to be governed by fewer subjects, or, at least confined to a narrower range than boys, and the replies were considered as less trustworthy and reliable - a characteristic which might follow more

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[1] L. P. Ayres. The Public Schools of Springfield, Illinois. pp. 131-140.

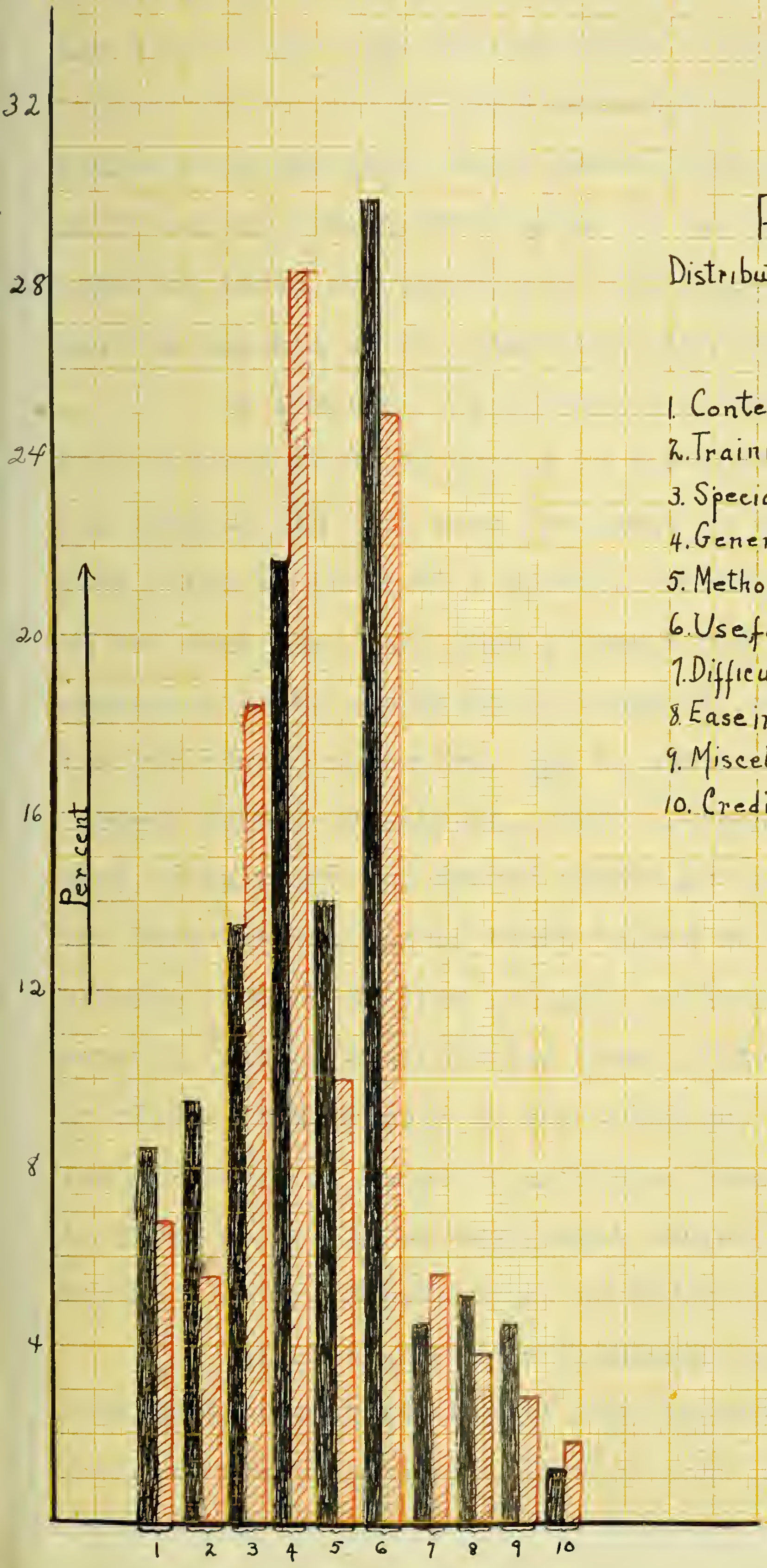

Figure I

Distribution of reasons for preference _ School S_2

Boys _ 220 ▬

Girls _ 224 ▨

1. Content of subject.
2. Training, or skill.
3. Special aptitude, or interest.
4. General interestedness or disinterestedness.
5. Method and Teacher.
6. Use for the Subject.
7. Difficulty in the Subject.
8. Ease in Understanding the Subject.
9. Miscellaneous reasons.
10. Credits, or Required Subjects.

U. OF S. S. FORM 3

easily where the preference shows no attempt at analysis than where it is based upon some concrete and tangible results ascribed to the study of the subject. Since the number of each is so nearly the same -- 220 boys and 224 girls - their replies seem to be quite comparable. A look at the diagram shows use to be the largest group, followed by the group which merely indicated interest or the lack of it as the reason. This group is the one about which there may be question since one cannot say what enters into the preference. This will be touched on in connection with the other schools.

A similar classification of two other schools, M and O, with returns from 147 pupils in the one and 184 in the other, shows the tendency in each case for girls to estimate their preferences more often in terms of a special interest or aptitude than boys do; at the same time they show a larger per cent of unanalyzed judgments, or those expressed in terms of interest without indicating the particular incentive. Use is again the term including the largest number of answers, girls' responses exceeding those of the boys, even where the actual number of individuals is slightly less. The large percentage of those making no discrimination but that of stating like or dislike is again noticeable. It is likely that several factors are included here, although they do not state them. By closer inquiry good or bad teaching, kind of subject, and similar factors could be found to influence here. The fact that this reason is given is not to be overlooked whatever may enter into it, and it may be a motive impelling to achievement as strongly as any.

Girls acknowledge difficulty as a reason more often than boys do in the three schools thus examined, and the boys exceed in miscellaneous responses that show some reasoning underlying them.

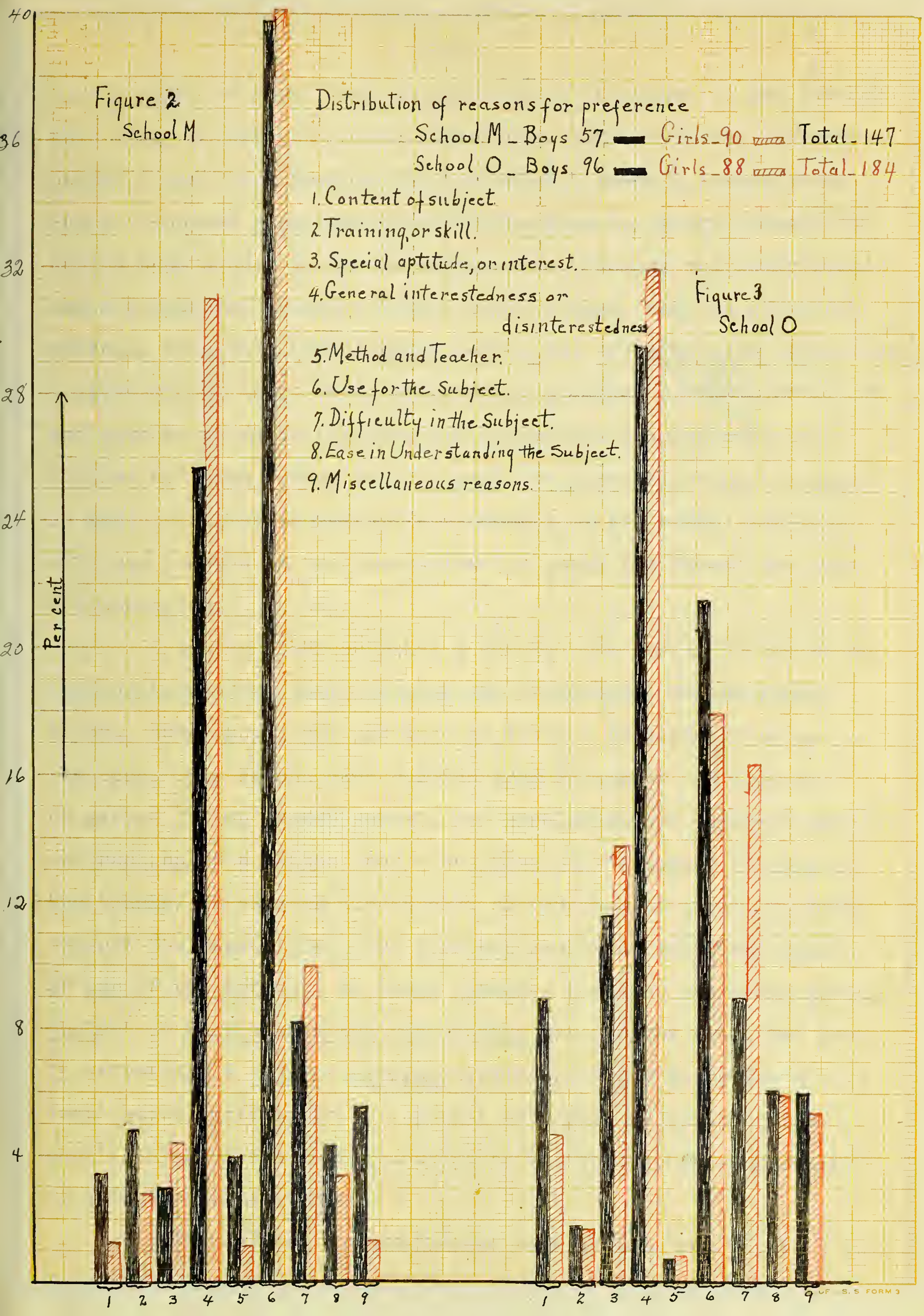

Figure 2
School M

Figure 3
School O

Distribution of reasons for preference

S. S FORM 3

Boys seem to be more frank in attributing the cause to the teacher. This might be because of sex difference. Many boys may, perhaps, prefer a man for a teacher but are under a woman's instruction. School O showed much less of an inclination to assign reasons for choice than school M. In the latter, the teachers and superintendent had been for a longer time without change, and the plans for entering into work upon leaving school are probably more emphasized. In this school there is an intentional planning of the curriculums and courses so as to fit many for industrial occupations, and a "follow up" plan taking into account the occupations most engaged in and the degree to which the graduates of the school continue with any success in the occupation for which the school has been a preparation.

In two other schools, B and S_1, the pupils indicated on the questionnaires their reasons for preference. In the former school, every pupil but one made an attempt to explain his preferences. This school sent replies from 83 pupils, 35 boys and 48 girls. In the latter school, the enrollment was somewhat larger and replies were gotten from a majority of the number filling out the blanks. These were 116 in all, 50 boys and 66 girls. In both schools the reason given the greatest number of times was that of use of the subject. In these schools, however, the group giving content or knowledge about the subject was greater than that merely expressing a like or dislike without giving a basis for it. It seems quite justifiable to say that the great majority of the pupils think of the practicability of the subject in connection with their interest in it.

The reasons for preference were gotten from school U in

a different way. This was the first school in which the inquiry was made. It may be remembered that the pupils in that school were not asked to analyze their preferences to find the reasons for them. From material in another study[1] which was being carried on at the time, some analyses of preference were secured. Eighteen boys and twenty-nine girls who had ranked their studies in order of preference on the questionnaires gave in an interview with the experimenter their reasons for preferring some subjects rather than others. The number is too small to cite as conclusive; what convergence of reasons appears is under the head of special aptitude or interest, with close competition in ease in mastery, or understanding.

In summarizing the situation with regard to the reliability of preference so far as its analysis by the pupils is concerned, indications show that a large number do not get beyond the mere like or dislike, or at least an inarticulate interest, and that utility either for purposes of mastery of the subjects, or in achievement outside of school, plays a large part in their choice among subjects. In the case of this seemingly unanchored judgment, however, several factors -- quite legitimate -- may enter. It has been said that the classification is loose; it has been difficult to determine whether "interested in it", or "not interested in it" relate to the character of the subject matter, difficulty or ease

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[1] W. S. Miller: Mental Tests and School Performance as Conditioned by Age, Sex and Other Factors. A dissertation (as yet unpublished) having to do with the determination of general intelligence of high school pupils by means of mental tests.

of mastery, or some factor in the teaching. If a personal interview could be had in such cases, it is likely this large group would be decreased noticeably. It is plainly a factor which pupils recognize whatever possibilities it may or may not present for interpretation.

Some uniformity in replies from boys as against those from girls appears, the girls more often going more into detail in assigning reasons. Where a special incentive can be held in mind as a reason, more girls than boys relate that to their studies. That the teacher is not mentioned more frequently is probably accounted for by the fact that this factor figures underneath the other terms much more than can be determined by this method of securing data. In some cases where the superintendent of the school secured the replies, pupils may have been deterred from giving the teacher as a cause of low preference. That difficulty is not more often cited would lead one to infer that it is submerged in group four -- general attitude of interest or the lack of it.

The survey of reasons leads one to ask whether there is a field for the teacher to furnish exercise in discrimination among the benefits accruing from the pursuit of the various subjects, or to work deliberately for a greater focus upon certain branches of study. Whether this could be accomplished by making clearer before entering upon a subject of study what it is fitted to do for the pupil brings one face to face with the question of tampering with free election, or implies the arbitrary assumption that the subject will do the same for all. It assumes an exaggerated capability to predicate outcomes. It is not necessary, however, to prescribe preferences, but rather to judge whether they are suf-

ficiently well reasoned out to be regarded as significant;whether they will justify looking into the way subjects are taught that some should be uniformly preferred or rejected, or that they should reverse positions from first to last rank as they continue through the four years of high school; whether they indicate the satisfying of more fundamental needs, or are the result of certain traditions regarding the superiority or inferiority of some subjects to admit of desirable results. The preferences and their reasons, together with the results in school marks or other recognized benefits accruing from having taken certain studies may prove a better indication for right choice for pupils in time to come than any other means of direction.

It will be of interest to note the way subjects of study are regarded by boys and girls so far as a ranking on basis of first in preference and first in utility is concerned. From five of the six schools investigated, tables of per cents were made up of the expressions of preference and the judgments of utility. So far as it was possible, per cents were calculated for each preference. Comparisons of first preferences and first in utility only are made use of here. The tables have not been appended. This has been done in such detail by Brown and Minnick[1] that a repetition of such calculation is not advisable here. A brief explanation of the way the subjects were ranked by the pupils in these schools is all that will be given. This will serve to show

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[1] J. C. Brown and J. H. Minnick: A Study of Preferences of Secondary School Pupils for the Various Subjects and of the Ranking of the Subjects on the Basis of Utility as Judged by the Pupils. Journal of Educational Administration and Supervision, October and November, 1915.

the agreement between the data of the present study and those of the former one.

By the ranking of first in preference, English in four of the schools is given a higher place by girls than by boys, in two instances ranking first and third as against twelfth and sixteenth. In utility, however, there is identity of agreement in three schools and in the remaining two, a small difference in rank, viz., first in both cases by girls as against fourth and fifth by boys. It is evident that the usefulness of English is clearly recognized by high school pupils. Algebra is usually given a higher place than Geometry on basis of first preference by boys and preferred more often by them than by girls, who are found to put Geometry before Algebra on basis of first in preference or interest. At the same time girls' judgments of the utility of Geometry place that subject lower than Algebra and in three out of five schools their replies also put Algebra lower than do the replies of the boys. In these subjects, the relation between preference and utility on basis of ranking of first in each does not appear to be close. In three schools where Shorthand and Typewriting were in the program, girls give first preference to these subjects more often than boys do and uniformly judge them to be of greater utility. Due allowance must be made for disparity in numbers of boys and girls taking the subject; more girls than boys take typewriting; the results here tally with what one would judge to be the case in ordinary observation. Latin and German in all instances take higher rank by girls' preferences than by boys, and in three schools out of the five, Latin takes precedence over German. In utility, boys uniformly rank Latin higher than girls do. In German, their

estimates place it lower than those of girls do. Girls, however, see use for Latin more often than for German. That is to say, both girls' and boys' rankings have the same order for Latin and German, but the percentages based on girls' estimates of first in utility would locate them between the two positions accorded them by boys' estimates. It is interesting to note that the ranks are evenly divided in preference in American History in four of the schools, two schools showing girls as first in preference more often than boys and vice versa. In reports on utility, where pupils have not been equally impressed with the usefulness of American History, - which is the case in schools O and S_1, - the tendency is for girls more often than boys to judge it high in utility.

These results agree quite generally with the findings regarding utility of subjects in the investigation[1] previously mentioned. One variation, found in three of the five schools, is that regarding the relative positions of Algebra and Geometry when based on boys' judgments of first in utility. The former study found that they ranked Geometry higher than Algebra on this basis; in these replies Algebra ranks before Geometry. The rankings for mathematics occur here, as in the former study, in the upper part of the table of rankings. History rankings for both boys and girls stand at the middle or a little below in the tables in both studies.

The distribution of preferences and judgments regarding utility of subjects is shown by the tables and figures following. In similar tables and figures the relation between preference and

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[1] J. C. Brown and J. H. Minnick: A Study of the Preferences of Secondary School Pupils for the Various Subjects of the Curriculum. Teachers College Record, November, 1915.

difficulty is shown. For example, Figures 4 and 5 with the accompanying tables show the distribution of the cases and the degree of agreement between the medians of preference and the medians of utility in English for 70 pupils, boys and girls, in one school and 120 in another. These schools are comparable in enrollment, and the administration of the program of studies seems to be similar. No wide range of electives is offered and the college preparatory subjects get the most emphasis. Not so great a number of returns was gotten from one as the other making the numbers in English somewhat out of proportion for comparison, but the general situation, however, makes it seem worth while to note boys' and girls' tendencies to choice in the two schools.

Figure 4 shows that the medians of preference corresponding to the various degrees of usefulness when connected by a line (solid line) drop from a point rather low in second rank to a point in fourth and very near fifth, while the medians for utility (dotted line) lie within the first rank of usefulness except at the lower end where the median is found to be in W, the third position in point of being most useful. The general direction of the lines indicates a positive correlation though probably a small one; it can be seen that usefulness is often considered as a reason for preference for English though not always in a corresponding degree to the preferences as given for that subject. In Figure 5, the relation is less close as is shown by the position of the lines almost at right angles. A glance at the distribution of the individual judgments in the tables shows the likelihood of close correlation to be small in this instance, as they are massed under U in utility but range over all the preferences.

Comparison of Pupils' Preferences for English with their Judgments of the Utility and the Difficulty in the Subject.

Table I

Rank	Utility U	V	W	X	Y	No
I	18	2				20
II	11	2	1	1		15
III	9	2	2	1		14
IV	9	2	2	3	1	17
V	2		1	1		4
No	49	8	6	6	1	70

School B Boys & Girls

Table II

Rank	U	V	W	X	Y	No
I	35	2	1	1		39
II	23	11	1	1		36
III	17	3	3	1		24
IV	17	1	2			20
V	1					1
No	93	17	7	3	0	120

School S_1 Boys & Girls

Tables showing ranking of English in preference and utility

Table III

Rank	Difficulty A	B	C	D	E	No
I	3	4	7	4	2	20
II	3	2	8	1	1	15
III	2	4	8			14
IV	6	4	4	3		17
V	2	1	1			4
No	16	15	27	9	3	70

School B Boys & Girls

Table IV

Rank	A	B	C	D	E	No
I		7	14	15	3	39
II	5	12	8	8	3	36
III	4	11	4	5		24
IV	4	8	6	2		20
V	1					1
No	14	38	32	30	6	120

School S_1 Boys & Girls

Tables showing ranking of English in preference and difficulty

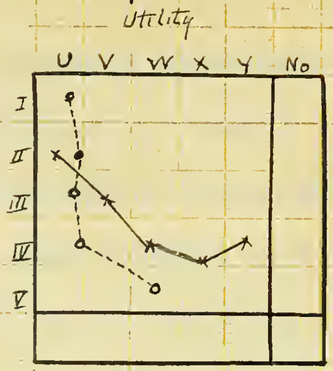

Figure 4.

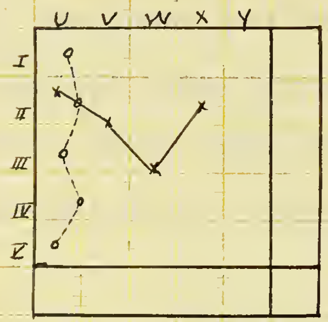

Figure 5.

Curves showing relation of medians in ranking of English in preference and utility.

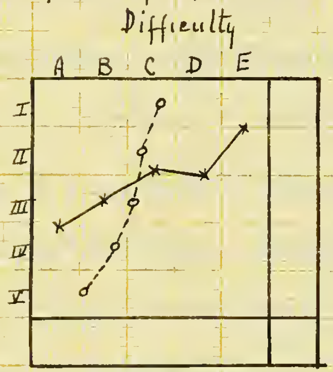

Figure 6.

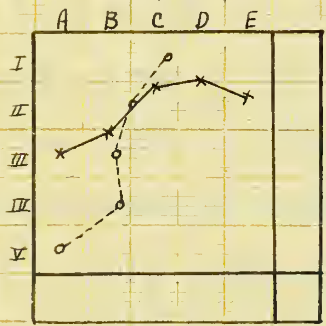

Figure 7.

Curves showing relation of medians in ranking of English in preference and difficulty.

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A similar handling of the judgments regarding the difficulty in the subject is shown by Figures 6 and 7 with their accompanying tables. These are the same pupils represented in Figures 4 and 5. The direction of the line showing median Preferences is now the reverse of that in the ranking for usefulness, and that of the median Difficulty follows it for only a short distance. In general, the direction of the lines indicates a negative correlation. This could be expected since pupils will not, as a rule, give their first preference to their most difficult subject although frequent scattered instances are found in which they do so.

To find how length of time spent in a subject influences the association between preference and utility, a comparison has been made of the reports of 92 Freshmen and 68 Seniors in English in school U. The same comparison is made with 109 Freshmen and 60 Seniors in school S_2. These are shown in Figures 8 and 9.

The relation lines in Figure 8 represent the preference corresponding to each group or rank of usefulness. Freshmen are shown to attribute usefulness in a high degree to English, but this is not proportionate to the order of preferences. This can be seen by the deviation from a relation line which, if perfect, would be the diagonal from the upper left hand corner of the diagram to the lower right hand corner. With Seniors there is slightly more correspondence. The line connecting the medians of preference in groups W, X and Y of utility shows this. Their preferences as related to utility are lower in rank than those of Freshmen.

In school S_2, correspondence between preference and utility is again found to be closer with Seniors than with Freshmen.

Comparison of Freshmen and Seniors in their Ranking of English in Preference and Utility

English

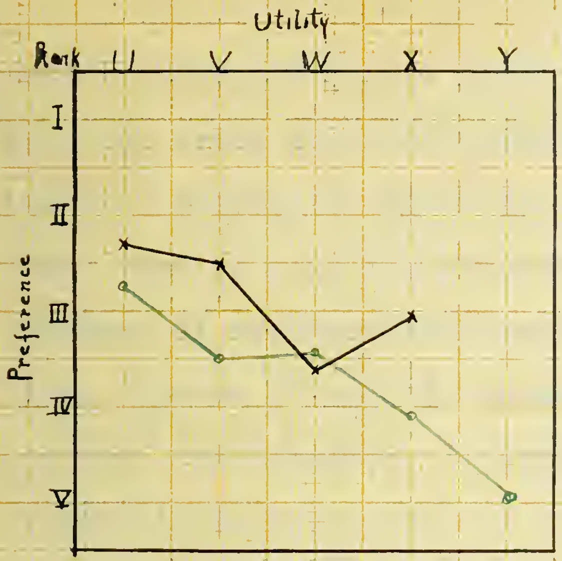

Figure 8

School U

Boys & Girls

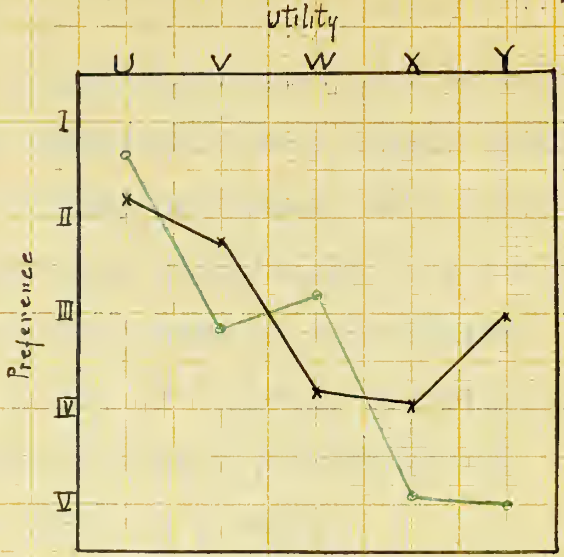

Figure 9

School S_2

Boys & Girls

Curves showing relation between preference and utility as indicated by the median preference for each degree of utility.

Freshmen _ 92 cases _ black line.

Seniors _ 68 cases _ green line.

Freshman _ 109 cases _ black line.

Seniors _ 60 cases _ green line.

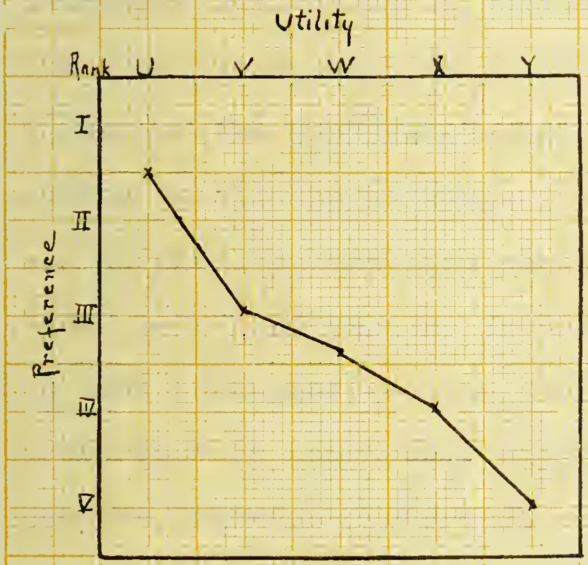

Figure 10

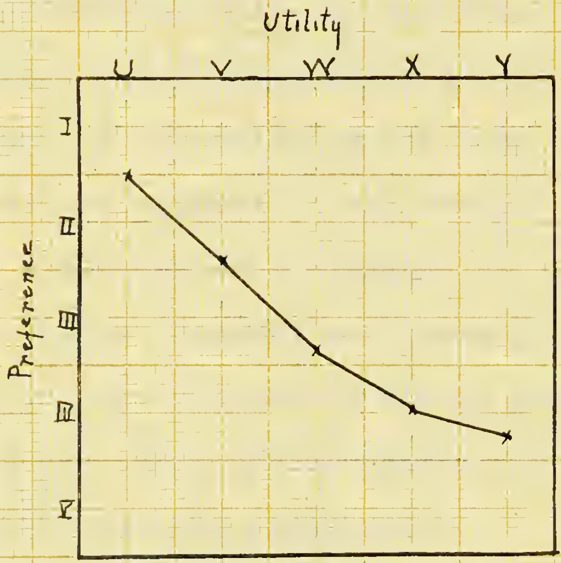

Figure 11

Curves showing same as Figures 8 and 9 with Freshmen and Seniors combined in each school.

School U _ 160 cases.

School S_2 _ 169 cases.

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This is shown in Figure 9. The deviations which occur are determined by a few cases and scattering; more cases would very likely bring the line nearer the diagonal. In all these instances, more cases would tend to make the relation lines more significant. The combination of Freshmen and Seniors and the change in the relation line, Figures 10 and 11, shows the effect of a better distribution and what the tendency to correspondence between preference and utility in English would be for the group as a whole.

In Figures 12 and 13, the same groups of pupils are represented as they reported on preference and difficulty. The lines here show a negative correlation as they pass along a diagonal in a direction opposite to that in the diagrams for preference and utility. Figure 12 shows that in the case of Freshmen preference decreases noticeably as difficulty increases. This is indicated by the black line which is a true diagonal for the upper right hand fourth of the surface of distribution. If the relation had been closer in all the rankings from lowest to highest in preference and difficulty, the line would have continued as a diagonal to the lower left hand corner. In the same figure, Seniors are shown to be less influenced by the difficulty of the subject so far as their preference is concerned. Figure 13 shows less correspondence, in general, between preference and difficulty than Figure 12.

Figure 14 and 15 show the relation between preference for the subject and the degree of usefulness judged to be in the subjects as shown by the rankings of 60 Freshmen, 30 boys and 30 girls, and 54 Seniors, 24 boys and 30 girls in History in school U. Some allowance must be made for the fact that with the Freshmen the subject is Ancient History, while with the Seniors it is

Comparison of Freshman and Seniors in their Rankings of English in Preference and Difficulty

English

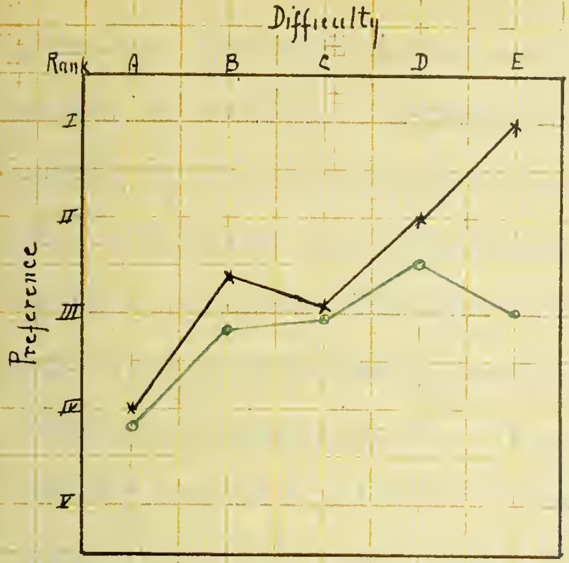

Figure 12

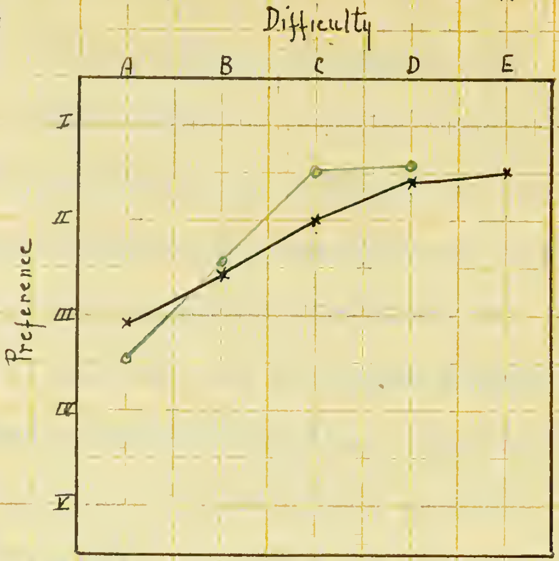

Figure 13

School U Boys & Girls

~~School~~ S_2 Boys & Girls

Curves showing relation between preference and difficulty as indicated by the median preference for each degree of difficulty.

Freshmen _ 92 cases _ black line.

Seniors _ 68 cases _ green line

Freshmen _ 109 cases _ black line

Seniors _ 60 cases _ green line

Comparison of Freshmen and Seniors in their Ranking of History in Preference and Utility

History

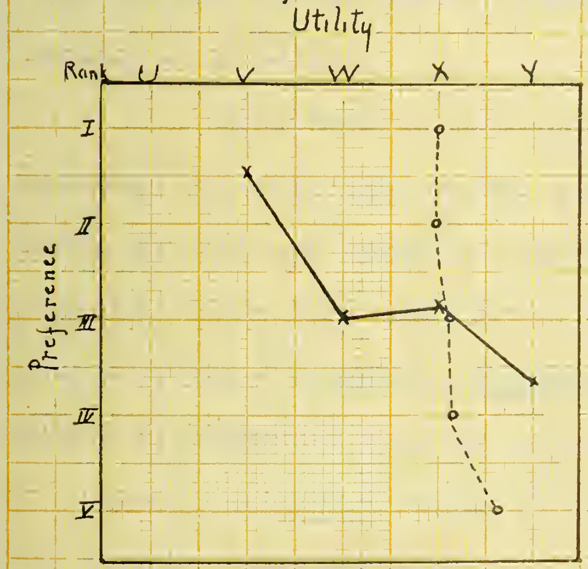

Figure 14

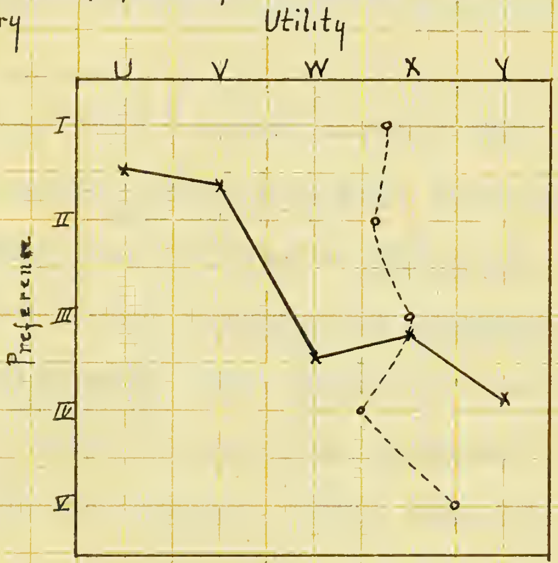

Figure 15

School U Freshmen Boys & Girls

School U Senior Boys & Girls

Curves showing relation between the medians of the two sets of rankings _ preference & utility

Freshmen in Ancient History _ 60 cases

Seniors in American History _ 54 cases.

Preference Median = solid line.

Utility Median = dotted line

American. The difference in content might easily influence the notion of utility. History does not rank high in utility judging either by the per cents assigning it as first in utility, or in the comparison by the relation lines showing the position of the medians for each. Neither do Seniors show a marked tendency to weigh the corresponding usefulness of History in the same degree as their preference for it. It is somewhat surprising that American History is not considered more useful. It is shown here as only third in utility when taken at its highest. It would be interesting to have similar returns from the remaining schools but too frequently such a small number of those answering the questionnaire happened to include History in their program that it was impossible to get a number large enough in one division of History from which to draw reliable conclusions. It seemed inadvisable to consider the rankings in all divisions of History taken together, since the content varied so widely.

In school U, the number of pupils ranking Algebra and Geometry in utility, ranked Algebra higher than Geometry. This was shown by the per cents of those naming the subjects as first in utility. With boys and girls, Algebra ranked seventh and eleventh respectively, Geometry, eighth and sixteenth. Boys were more interested in Geometry than in Algebra, placing it by their judgments in ranking at fifth place in the order of ranking, while Geometry was eighth in rank order.

In the frequency tables, Tables V and VI, made from the reports of 129 boys and girls in Algebra and 82 in Geometry, the relation between preference and utility is borne out. The larger frequencies tend to appear in the surface of distribution in those

Comparison of Pupils' Preferences for Algebra and Geometry with their Judgments of Utility in Them.

Algebra

r = .694

Table V

Rank	U	V	W	X	Y	No
I	10	9	7		1	27
II	3	10	8	2	1	24
III	7	6	9	5	1	28
IV	2	11	6	12	2	33
V	2	4	5	3	3	17
No	24	40	35	22	8	129

School U   Boys & Girls

Table showing distribution of 129 cases in Algebra

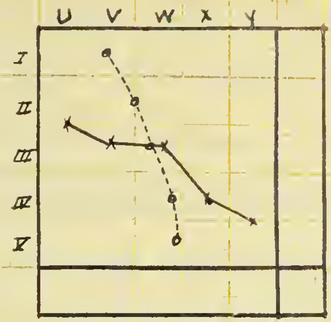

Figure 16.

Curves showing relation of medians in rankings of preference and utility in Algebra.

Geometry

r = .68

Table VI

Rank	U	V	W	X	Y	No
I	10	7	2	3		22
II		7	8	3		19
III	2	4	6	7	2	19
IV	1	2	1	6	3	14
V	1	1	1	3	2	8
No	14	21	18	22	7	82

School U   Boys & Girls

Table showing distribution of 82 cases in Geometry.

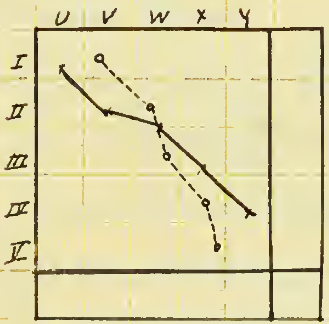

Figure 17.

Curves showing relation of medians in rankings of preference and utility in Geometry.

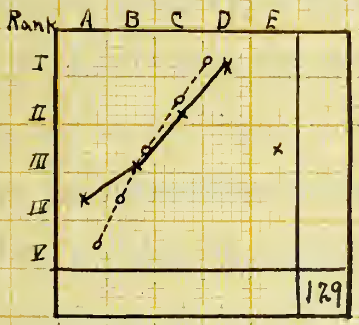

Figure 18

Curves showing relation of medians in ranking of preference and difficulty in Algebra. Same group as represented in Figure 16.

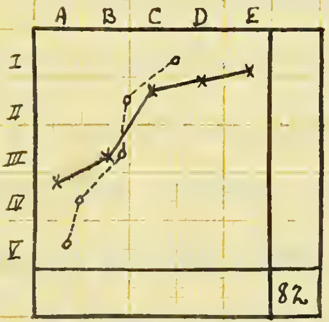

Figure 19.

Curves showing relation of medians in ranking of preference and difficulty in Geometry. Same group as represented in Figure 17.

In the tables and figures, the numerals I-V mean rankings in preference; U-Y, rankings in utility; A-E, rankings in difficulty.

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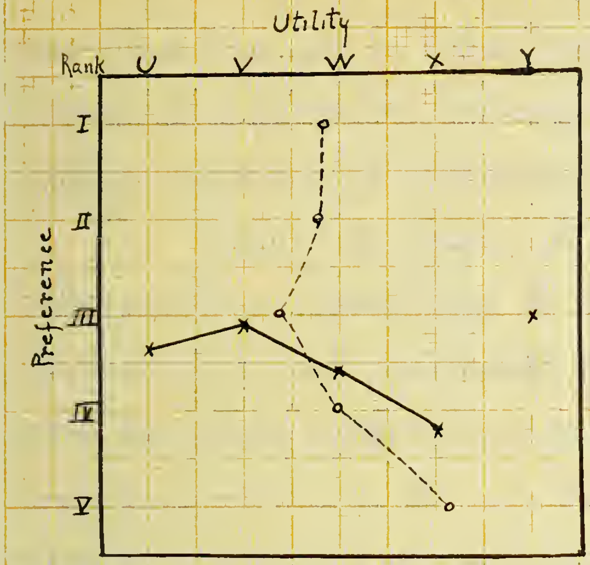
areas which represent the path of a diagonal from the upper left hand corner to the lower right hand corner. The relation lines in Figures 16 and 17 show that the medians of preference and utility also approach fairly near a diagonal representing a relation of agreement. The correlations were figured here since both the number of cases and the distribution were such that the coefficient is reliable. The correlation between preference and utility for Algebra is .694, with a P.E. of .09; in Geometry, it is .68, with a P. E. of .12. Figures 18 and 19 show the relation between preference and difficulty in the same subjects for the same group.

It is interesting to note the character of the replies from subjects which are a preparation for commercial work, a trade, or, at least are an immediate means of a livelihood after leaving school. The difficulty in this investigation, however, is that sufficiently large numbers have not been secured out of the entire 1410 pupils to make a final conclusion. Some of the schools offer so little aside from the purely academic subjects that they must be left out entirely. From schools M, S_2, and U, however, a small number of replies from girls in Typewriting were secured. These are too small to admit of significant correlations, but the general tendency to agreement between preference and utility appears in the direction of the relation lines in Figures 20-22. These represent the replies of 24 girls from school M, 29 from school S_2, and 41 from school U. From these it appears that in schools M and S_2, the use seen in typewriting coincides rather closely with the preference for it. It is the belief of the writer that the reason can be found in these schools in the way these courses have been carried on, or in the community, or in both. It is likely also that

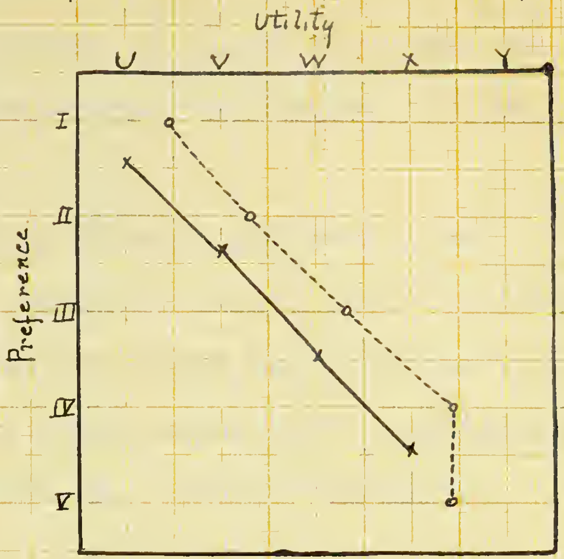
Comparison of Girls' Preferences for Typewriting and their Judgments of its Utility.



School U Figure 20 Girls

Relation lines showing position of medians for the rankings of preference and utility. The small cross in III-Y indicates but one case.

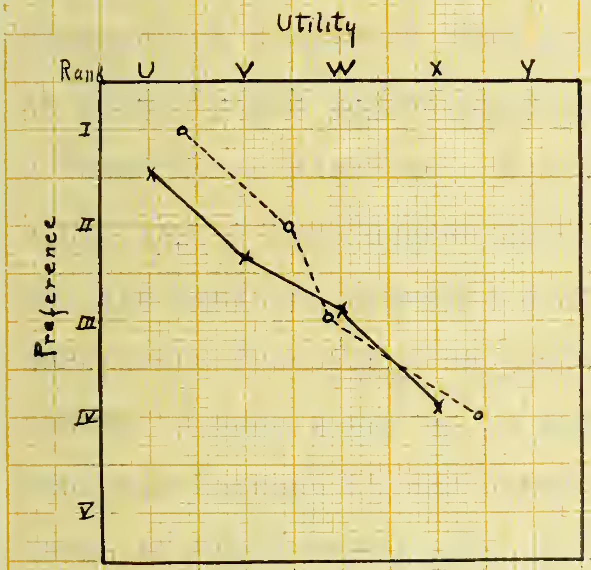
Number of cases = 41



School M Figure 21 Girls.

Relation lines showing position of medians for the rankings of preference and utility.

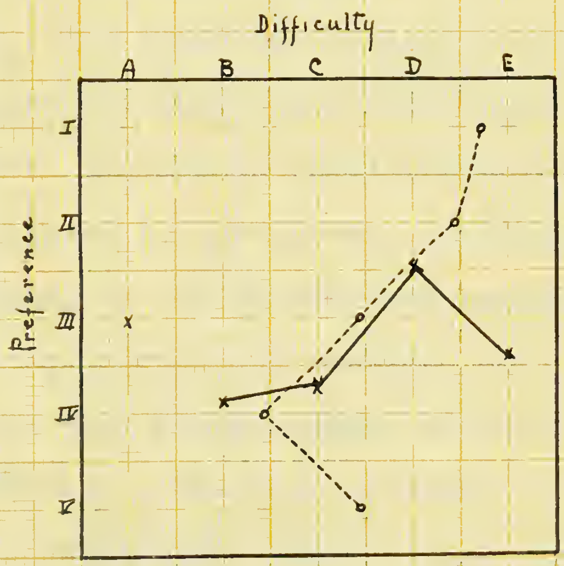
Number of cases = 24.



School S_2 Figure 22 Girls

Relation lines showing positions of medians for the rankings of preference and utility.

Number of cases = 29



School U Figure 23 Girls

Relation lines showing position of medians for the rankings of preference and difficulty. The lines are opposite in direction to those representing utility indicating a negative relation.

Number of cases = 41; group same as in Fig. 20.

In these figures the solid line = preference; dotted line = utility or difficulty.

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the immediate use to which such a subject is to be put makes the factor of utility so much more concrete that it appears in more marked closeness to preference.

Figure 23 shows the relation between preference and difficulty in Typewriting as it is judged by the 41 girls in school U. That it is not considered difficult is shown by the dotted line with its upper extremity in column E, the lowest rank in difficulty, and its lower in D, but one rank above the lowest. The highest rank of difficulty corresponding to a given preference is in C, a rank shown here as the median group in the order of ranking. The grouping of the frequencies in the table points to curves of a decidedly skewed character.

A comparison of the preferences of boys for Manual Training and their judgments of its utility was made between 34 boys from school U, and 30 from school S_2. The character of their replies is shown by the curves shown in Figure 24. Those in school U show a tendency to rank the subject high in preference while recognizing a utility of some degree from the highest to the lowest. In school S_2, the median preference corresponding to the ranking for usefulness drops from first in preference to fourth, and the line continues in such a way as to indicate a very slight degree of relationship between it and utility, with the likelihood of such a large probable error as to render it unreliable. The relation lines in both cases indicate more nearly than a correlation figure could the conditions which actually exist, since the number of cases is small and the distribution so scattered as it is seen to be in Tables VII and VIII. Table IX and Figure 26 shows the rankings of 32 boys in Latin from School O. These offer chance for comparison

Comparison of Boys' Preferences in Manual Training and Latin in Relation to the Utility in the Subjects.

Manual Training

Table VII

Rank	U	V	W	X	Y	No
I	4	1	2	2	1	10
II				4	2	6
III	1		1	1	1	4
IV		1	1	1	2	5
V	1			2	2	5
No	6	2	4	10	8	30

School S_2 Boys

Table showing distribution of reports on preference and utility

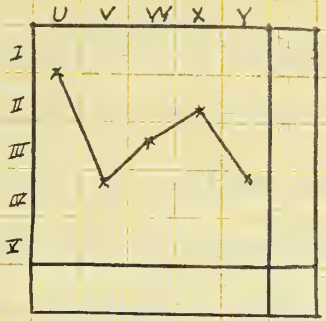

Figure 24

Relation line showing the median preference for each corresponding ranking of utility

Table VIII

Rank	U	V	W	X	Y	No
I	2	5	3	1		11
II		5	1	3	1	8
III		3	5	2		10
IV			2	3		5
V						
No	2	11	11	9	1	34

School U Boys

Table showing distribution of reports on preference and utility

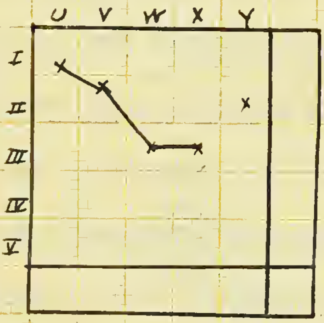

Figure 25

Relation line showing the median preference for each corresponding ranking of utility.

Latin

Table IX

Rank	U	V	W	X	Y	No
I	3	1	3		1	8
II	1	2	2	1	1	7
III	3	1	2	1		7
IV	1	2	1	4		8
V				1	1	2
No	8	6	8	7	3	32

School O Boys

Table showing distribution of reports on preference and utility

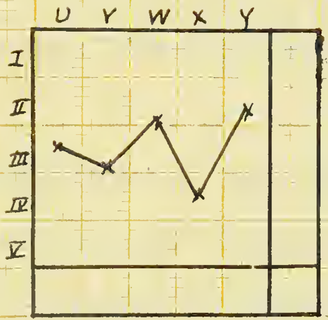

Figure 26

Relation line showing the median preference for each corresponding ranking of utility

In these tables and figures the numerals I–V indicate rankings in preference; U–Y, rankings in utility.

with Manual Training.

The small number of replies received in Domestic Science from the smaller schools made it impossible to compare adequately the interests of girls in that subject in the various schools. There are shown, however, in Figure 27, curves for 107 girls in school S_2. In this instance, the agreement between preference and utility is quite close. The degree of correlation is .809 with a P. E. of .11.

In school S_2, the program of studies extends over a large number of subjects. The questionnaires filled out from this school listed thirty-eight different studies. Out of these it has been difficult to get a large number taking any one industrial subject. It has been possible, however, to use for purposes of comparison, 95 replies of girls in Latin with 107 in Domestic Science. The curves in Figure 27 show how to what extent the relation lines for preferences and the corresponding utility coincide with a line representing perfect agreement. The tendency to rank Latin low in preference but with a utility of fairly high rank causes most of the cases to be located in the lower left hand fourth of the area of distribution and thus pulls the curve away from a diagonal which would represent a perfect agreement.

A comparison was made of the replies of boys in Latin in school S_2 with those of girls in the same school. Eighty-three boys ranked Latin in preference and utility as Table 12 shows. Ninety-five girls did the same for the subject. This is shown in Table 11. Figure 28 shows the amount of agreement between their replies and the extent to which each group shows agreement between preference and utility. It is evident from the line representing the median preference of boys (black line) that the median preference correspond-

Comparison of Girls' Preferences in Domestic Science and Latin in Relation to the Utility in the Subjects.

Table X

Rank	U	V	W	X	Y	No
I	14	12	8	1	2	37
II	6	10	5	5	1	27
III	2	6	10	6	2	26
IV		3	4	5	1	13
V				1	3	4
No	22	31	27	18	9	107

School S_2 Girls

Table showing distribution of reports on preference and utility in Domestic Science

Table XI

Rank	U	V	W	X	Y	No
I	4	4	4			12
II		11	7	1		19
III	1	6	9	2	3	21
IV	3	8	8	7	5	31
V	2	2	2	3	3	12
No	10	31	30	13	11	95

School S_2 Girls

Table showing distribution of reports on preference and utility in Latin

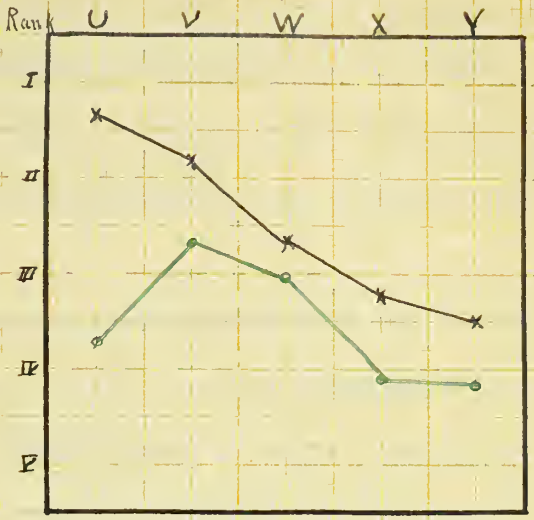

Figure 27.

Curves showing relation between preference and utility as indicated by the distribution in Tables X & XI

Domestic Science = black line

Latin = green line.

Comparison of Boys' and Girls' Preferences in Latin in Relation to the Utility in the Subject.

Table XII

Rank	U	V	W	X	Y	No
I	9	3	5	3		17
II	3	4	1	2		10
III	6	8	6	3		23
IV	1	6	4	5	1	17
V	3	3	2	4	4	16
No	22	24	18	14	5	83

School S_2 Boys

Table showing distribution of reports on preference and utility in Latin

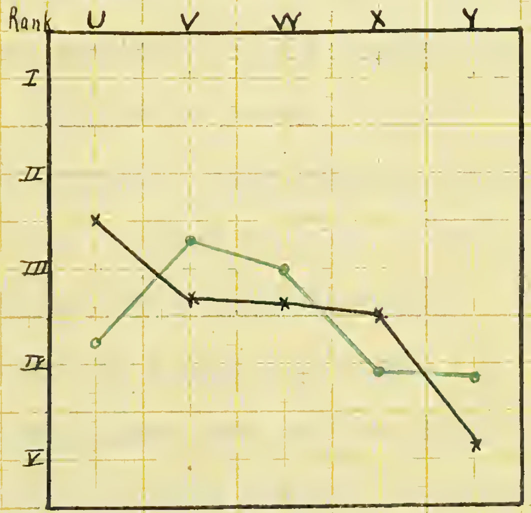

Figure 28

Curves showing relation between preference and utility as indicated by the distribution in Tables XI & XII

Boys = black line. Girls = green line.

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ing to the highest rank in utility is higher than that of girls and decreases to the lowest rank of preference corresponding to the lowest rank in utility. In these respects it shows more agreement between the two factors than the line representing the reports of girls.

The relation between preference and difficulty has been found in all cases to be an inverse one. This is not contrary to prevailing opinion. It may show that difficulty is more nearly related to preference in some subjects than in others. At any rate, difficulty is a factor influencing preference.

While it is interesting to see the factors that enter into the choice of subjects and the extent to which any selected group of factors appear in a direct or an indirect ration to those choices, it is worth while to note how dependable are the expressions of preference which are made. Some care has been taken to find out how permanent the preferences are.

In school U, a considerable number of the pupils giving replies for this study were being used as subjects for a study of intelligence. It was possible to secure answers of 156 pupils to questions which aimed at getting data similar to those in this study. In fact the data secured by that inquiry were much more the result of close analysis than many of the replies in this study, since they came out of personal interviews. The main difference lay in the fact that in securing the preferences under the other investigation, the pupils were asked to name them out of the entire list of studies which they had ever taken in high school; this gave them a field from which to select much wider than that required in the present study since this asked that a choice be made only from

the studies which they were then taking. From 72 boys, however, 37 had named in conversation with the experimenter the same subjects and had indicated as the first preference the same subject as they gave in their later judgments on the questionnaires. Of these, 13 were Freshmen, whose experience in high school would, of course, not warrant them in making other than the same enumeration of studies in the two different reports of preference; the remaining 24 might easily have found chances to express themselves otherwise but did not do so. Of 16 who still made their choices out of the same list of subjects, but gave a different subject as first in preference, 9 were Freshmen. This lack of focus or permanence might easily occur from local conditions, or from mere temperamental qualities. The remaining 19 chose subjects not in their programs at the time both investigations were made and necessarily had different preferences. In investigating the replies of 84 girls given under the same conditions, it was found that 54 gave the same preference as before, half of these being Freshmen; of those selecting from the same list of subjects but giving a different preference, there were 10, and of those selecting from a wider range of subjects, 23. While these are not conclusive evidence of stability of preference, they show a considerable degree of consistency.

From the questionnaires themselves, where opportunity was given to state what changes, if any, the pupils had made since entering high school, an exceedingly varied response was gotten. If one could record and study the shifts both extreme and slight, it would be a revelation, no doubt, of teaching conditions in those subjects. Such a procedure was impossible to any appreciable degree.

Of the boys in school U, 145 in number, 34, or 23.4% indicated a change in first preference, while somewhere throughout their program of studies, 11 others had changed. This made 45, or 31% who had recorded a change. Of girls, 162 in number, 50, or 30.8% said they had changed their first preference, while 6 others had changed in some preference other than the first, 34.5% in all.

It is but fair to say that in securing responses from groups of considerable size, where a number of distractions in both from the printed blank and from the influence of the group, one cannot rely too strongly on replies of this nature. In the remaining 69% of the boys or the 65.5% of girls who indicated nothing as to change, it is impossible to say that all were stable in preference and hence might be worth considering so far as adjustments to meet those preferences are concerned. Some, no doubt, recorded no change because of indifference, or imitation of their neighbor where such a one was observed, or for lack of understanding. It was for this reason that a check ranking has been secured in which the pupils could be gotten to answer the same things again in connection with the same subjects.

Of the reasons given as cause of change in school U, use of the subject and teachers formed the largest groups, use predominating. Replies were secured from 33 of the 45 boys who had changed preference in any way, 20 of whom gave use; out of 49 girls giving reasons for change, 34 named use. From the entire number (71) assigning reasons, 9 gave their families as one of the causes, at times giving the teacher in addition. In these families, the parents and brothers and sisters had had some college or university education, except in one case. This is significant only when an

investigation of what studies are exchanged in preference is made and the interests of the family related to the change. This has not been followed through in this study.

Results from all the schools arranged in tabulated form show the following:

	Percents of changes in 1st Pref.		Per cent of all changes		Per cent of reasons for change given as use.		Number of pupils included in the study.	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
School B	55.5	29.1	55.5	45.8	45.	62.5	36	48
School M	6.8	14.1	6.8	15.	100.	50.	58	92
School O	40.1	56.1	67.6	69.3	58.2	52.9	99	98
School S_1	23.	17.9	26.9	18.	66.6	53.8	52	67
School S_2	19.1	18.4	27.	22.8	42.5	44.1	277	276
School U	23.4	30.8	31.	34.5	60.	69.5	145	162

That pupils are dependable so far as ability to rank subjects the same in their first and second attempts is concerned is shown by the returns from 120 pupils who ranked the same subjects a second time after a lapse of a year. The first ranking was not told them and they could have remembered, - at least they showed no signs of doing so. The selection was purely random, choice being made by taking every third paper from the total number first gotten from the school. It was convenient to secure these random ratings from but three schools; the three, however, served a purpose in that a thoroughly mixed group could be gotten. In school U, for instance, it so turned out that there was a fair percentage of children of university instructors and professors in the duplicate

ranking; school M has an industrial population; school O is an example of the ordinary farming and business community. In school M, where a very small per cent is shown by their own statements to have changed and where it is possible that the "follow up" plan referred to before might influence the tendency to stick to subjects when once taken up, it would have been to the point if the replies could have been balanced against those in school O, where the number changing had been much in excess of the other schools of like enrollment. Unfortunately, the numbers secured in the check from each were not large enough to take each school singly and prove whether permanence in one is more marked than in the other. What the replies do show is that the pupils have tended to make the same ranking and have somewhat consistently estimated the subjects in terms of use.

When the rankings of the 120 pupils, 54 boys and 66 girls, were tabulated, it was found that 28 boys were the same in their first preference and 33, the same in their last. Similarly, 41 girls gave their first preference the same as before and 36 gave their last as unchanged. The first and the last preferences were especially noted because these are the ones about which pupils, as a rule, have the strongest feeling-reaction. The intermediate preferences might shift for less prominent reasons. Twenty pupils ranked every subject in their program in exactly the same way as they had done the year before. Some of these had four subjects, some had five. This seemed to point to their having had definite reasons for their rankings. It is conjecture to say that these reasons might prove a hindrance or a help in accomplishing what they needed to accomplish in the various subjects, but it is of value to know

that preference can be so firmly established. This duplication of former preferences, together with pupils' judgments of the utility and difficulty of the subjects is the most convincing of the means used to find how permanent preferences are.

In the diagrams showing the location of each preference made by each pupil, the massing of the preferences along the diagonal of the square shows tendency to perfect agreement. Figure 29 shows the agreement between preferences of 54 boys in 1916 and again in 1917. Figure 30 shows the same for 66 girls. The effect of combining numbers is evident in the next figure, Figure 31, where the preferences are noticeably in agreement. The method of representing this agreement was as follows: Each ranking of a subject in preference and utility was represented by a dot in the diagram. Where each one of the 120 pupils had replied on each subject and his reply was recorded the result showed a close agreement with the former ranking.

The judgments of the same pupils regarding utility and difficulty were compared with those of the year before. What Figures 32-35 show is that these pupils have more consistently estimated the utility of the subject than the difficulty. A glance at the curves showing the relation of utility to preference and difficulty to preference shows less agreement between the two judgments of difficulty than those of utility.

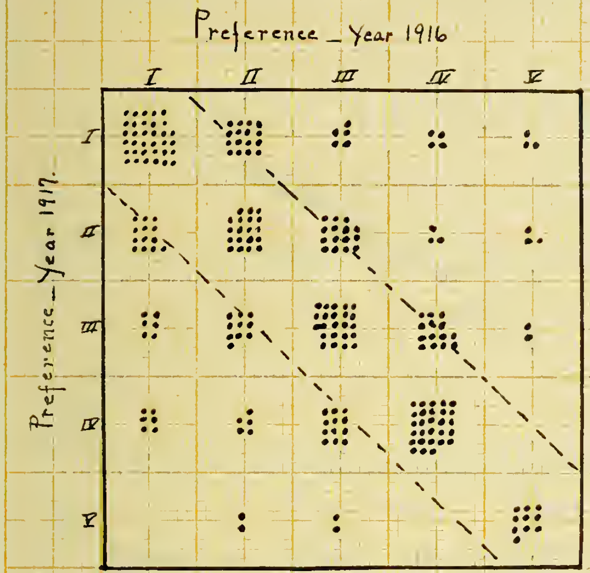
The results, taken as a whole, tend to confirm the following assumptions:

(1) That preference is permanent and defined in the minds of the pupils.

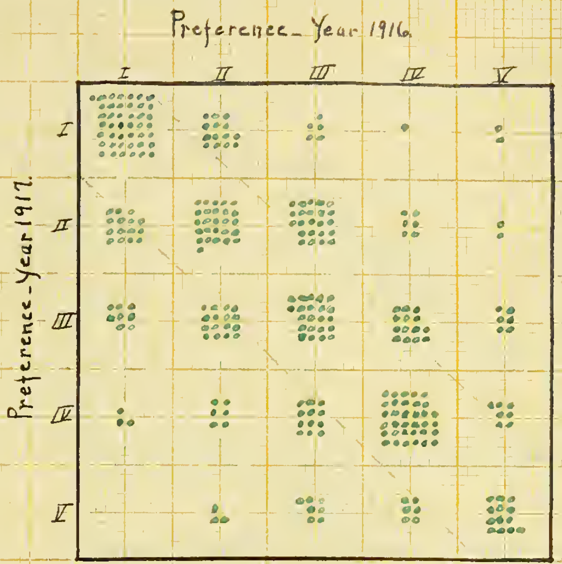
(2) That use to which the subject may be put and a

Distribution of Preferences over the Entire Program of Subjects of 120 Boys and Girls.

Permanence of Preference as shown in Agreement in Two Rankings made One Year Apart.



54 cases Figure 29 Boys



66 cases Figure 30 Girls

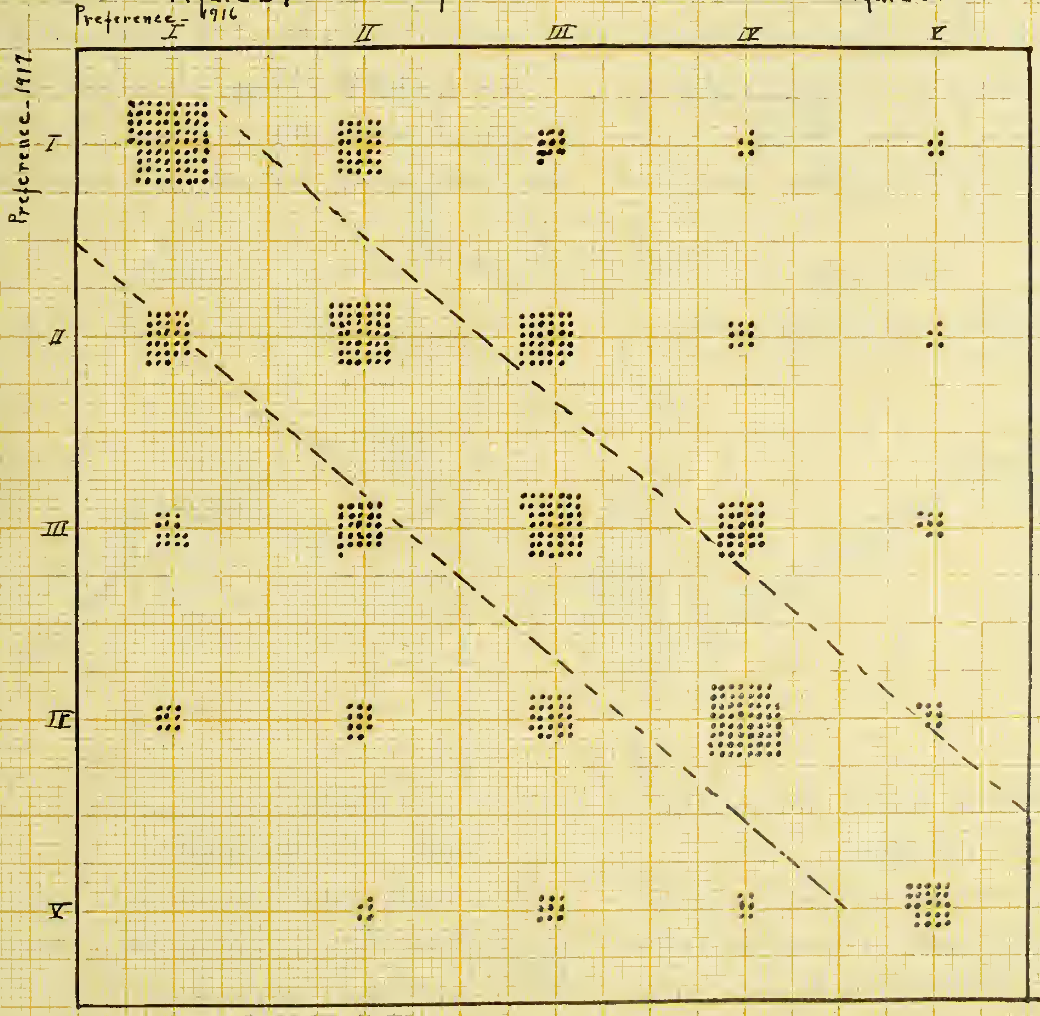


Figure 31.

Permanence of Preference as shown in Combined Rankings of Boys and Girls for their Entire Program of Studies. Each dot represents the report of a preference. Correlation shown by cases within the diagonals

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Comparison of Pupils' Rankings of Subjects in Preference and Utility at Periods Separated by One Year.

Permanence in Rankings as shown in Random Sampling of 120 Cases.

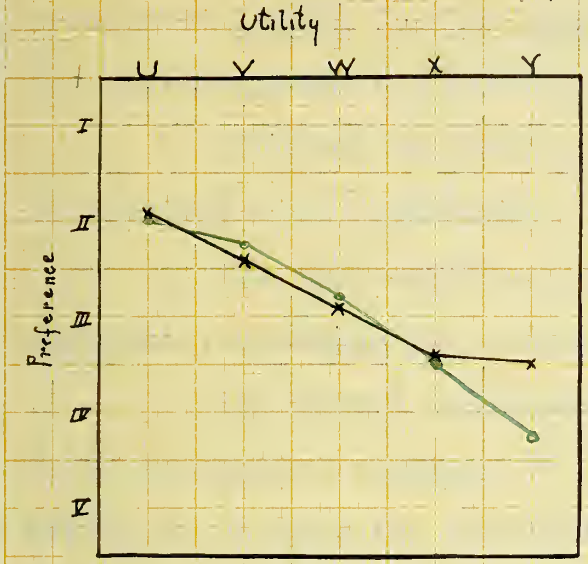

Figure 32 Boys

Relation lines showing median preference for each corresponding ranking of utility. The figure is based on the pupils' reports of their entire program of studies and represents 224 replies from the 54 boys making the ranking the second time. First ranking = black line; second, green line.

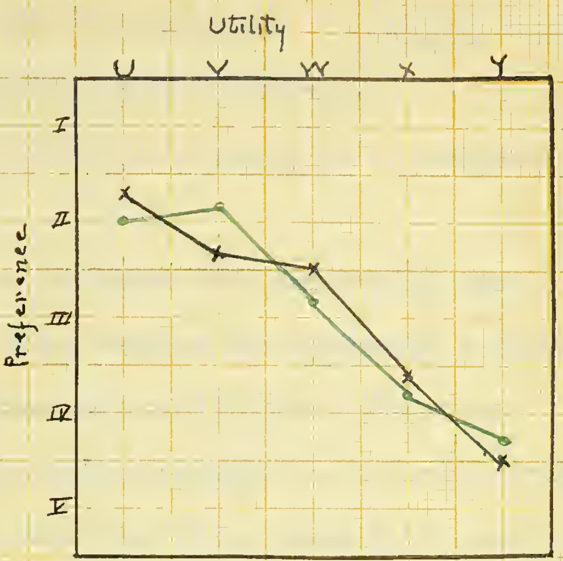

Figure 33. Girls

Relation lines showing median preference for each corresponding ranking of utility. The figure is based on the pupils' reports of their entire program of studies and represents 287 replies from the 66 girls making the ranking the second time. First ranking = black line; second = green line

Preferance and Difficulty

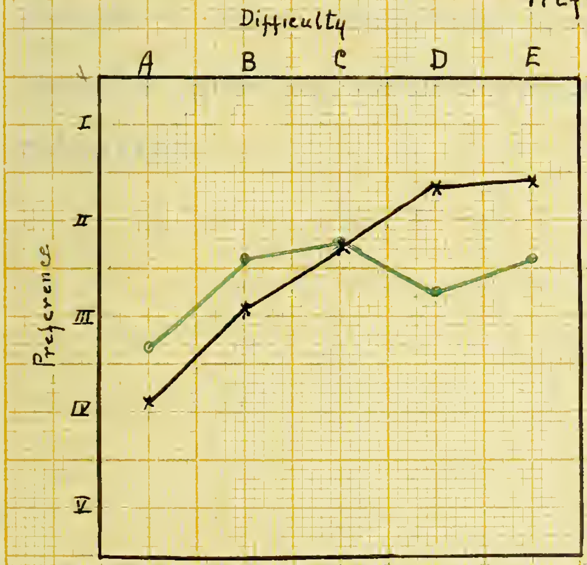

Figure 34 Boys

Relation lines showing median preference for each corresponding ranking of difficulty. The figure is based on the replies of the group represented in Figure 32.

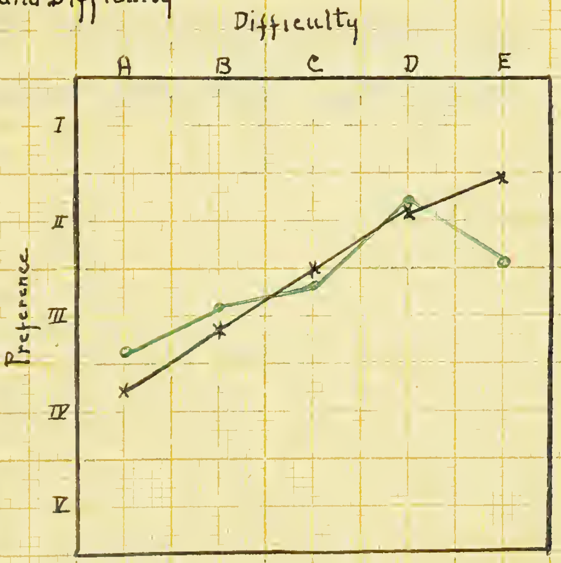

Figure 35. Girls

Relation lines showing median preference for each corresponding ranking of difficulty. The figure is based on the replies of the group represented in Figure 33.

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pronounced liking for the subject, or its opposite - dislike - are the factors generally given as entering into preference.

(3) That gradations in utility are fairly well related to gradations in preference.

(4) That difficulty and preference are inversely proportional, although not to such a large degree as commonly believed.

(5) That a noticeable degree of consistency is to be found in pupils' rankings of subjects with regard to the characteristics of utility and difficulty as well as with regard to preference.

(6) That although preference and utility have a close relation, practical application alone does not establish and maintain the interest.

The significant thing to teachers is to know the general tendencies regarding certain subjects of study and whether the causes of those tendencies are valid. The work of teaching may then be directed towards satisfying the needs that ought to be satisfied.

CHAPTER IV

The Relation Between Preference and Achievement

It is the purpose in this chapter to present the figures representing the correlation between preferences for school studies as they were reported by pupils and the grades those pupils made in the studies which they ranked in order of preference.

The preceding chapter has shown what pupils give as reasons for preferring some subjects rather than others. It has shown with a number of school studies how much of a relation exists between preference and one of the factors - utility - named by a large number of pupils. It has shown that the relation between preference for a subject and the difficulty of the subject is a negative one. Furthermore, it has given the results of an attempt to find how legitimate are the claims of preference to recognition by finding how permanent the preferences of high school pupils are.

There remains the fact that a great many boys and girls in high school are in a group which give interest or lack of it as the only reason for putting one subject before another. No correlation figures or graphs are presented to show the relation between such a reason for preference and preference itself. What can be said for a preference, when the character of so prominent a constituent is thus left unanalyzed? Is there sufficient credence to be given it to make a comparison of it with achievement worth while?

It may be impossible to answer these queries, but it seems hardly likely that we can say that interest has less significance as a reason for preference than utility or difficulty, or any reasons which are able to be expressed in what we like to believe are more concrete terms. While we cannot decide on what it is for

everybody, nor prescribe the exact measure of it which will prove to be the desirable one, we must admit that it operates too strongly to be left out of account. In connection with other stimuli to school progress, such as administrative devices, which are present by virtue of the institution of the school itself, it may be quite as significant as some of the other factors about which we think we are better informed. The point is, that the fact that this appears as a factor, does not make it impossible to be considered in relation to achievement.

Having found, then, with a considerable number of pupils that certain things enter into preference making it a really existent factor in school work, we may inquire how that preference appears with regard to achievement. Let us say, for example, that preference is stable and usually reported in terms of the utility seen in the subject. Suppose, then, a high correlation is found between achievement in English and preference for English. Whether one is the given factor and the other is to be related to it, or whether correspondingly high rankings in both are to be regarded merely as concomitant to each other, - that depends on what one wishes to prove. Suppose the latter is what one intends to establish. What can be offered to do this? In the case of English just mentioned, we may indicate the relationship as high or low, may point to the number of cases making the relationship reliable, and point out whether a high or low preference is attended by a corresponding degree of achievement in situations recurring frequently. In this we may justify their being called concurrent influences.

Preference and achievement in purely academic subjects may also be compared with their existence in proportionate amounts

in other subjects, such as the commercial subjects. Or, to state the comparison another way, preference for subjects dealing with abstract and general principles and with symbols and the corresponding achievement in such subjects may be compared with those mainly involving motor skill and the achievement in them. It is with such comparisons in mind as have been suggested that the correlations offered in the following pages have been made.

The method of comparing preference and achievement has been somewhat generally described in chapter two. As has been said, it is a method adapted to the handling of rankings where qualitative measurements only are considered. A description of the table showing the preferences and grade rank of boys in English (Table 13) will help in understanding the distribution of the frequencies and their subsequent handling in the computation of correlations. A reading of the figures in the compartments of the table would be as follows: beginning in the upper left hand corner and reading down column I, we find 12 boys who reported they preferred English above all their subjects, and who made their highest grade in it and are, therefore, in rank one in both preference and achievement. The number below it represents 6 boys who gave English first preference but made the same grade in English and another subject making their grade rank, or rank in achievement, one and one-half; the next 6, still reading down the column, gave English first preference but made their second highest grade in it or made the same grade in three subjects making the grade rank second, and the 3 following next preferred English to their other subjects but tied with another subject in their second highest grade. Similarly, reading across the first row, we find 12 boys giving English first preference; 11,

Comparison of Boys' Preferences in English with their Achievement in English

Preference

Grade Rank	I	II	III	IV	V	No
1	12	11	6	2	2	33
1.5	6	3	2		1	12
2	6	8	9	4		27
2.5	3	1	5	1	2	12
3	7	10	11	9	2	39
3.5	2	3	1	3		9
4	12	7	15	9	3	46
4.5			4	3	2	9
5	5	3	5	5	9	27
No	53	46	58	36	21	214

School S_2 Boys

Table 13

Table showing distribution of preferences of boys in English and their ranking in achievement as indicated by their grades in the subject. The figures in red indicate where the cases would be found if the correlation were perfect. A balancing of the frequencies on the sides of the diagonal indicates a relation of agreement for the characteristics as distributed here. $r = .45$.

Comparison of Preference and Achievement in Two Subjects

English

Preference

Grade Rank	I	II	III	IV	V	No
1	10	1	3	1		15
1.5						
2	8	5	4	6		23
2.5						
3	2	5	3	3		13
3.5						
4		1	1	4		6
4.5						
5		1		2	2	5
No	20	13	11	16	2	62

School B Table 14 Boys & Girls

Table showing distribution of preferences and corresponding rank in grade for each preference. $r = .606$

Book-keeping

Preference

Grade Rank	I	II	III	IV	V	No
1	15	3	3	1	1	23
1.5		2			1	3
2	9	4	2	2	2	19
2.5	3	1	1	1		6
3	4	2	1	3	1	11
3.5				2		2
4	2	1	1	1		5
4.5				1		1
5	3			1	1	5
No	36	13	8	12	6	75

School S_2 Table 15 Boys & Girls

Table showing distribution of preferences and corresponding rank in grade for each preference. $r = .562$

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second preference; 6, third preference; 2, fourth; and 2, fifth. Thus a pupil might by his ranking of the subject in preference and his achievement in the subject be *first* in *preference* and *first* in *grade rank*, or he might be represented by *one* in preference but by *one* and *one-half*, *two*, *two* and *one-half* and so on in the grade rank. If the correlation between preference and grade rank were higher, the frequencies would be found in greater numbers in the parts of the table where the figures in red are seen; if it were perfect, all portions of the surface of distribution would be blank except those indicated in red.

The double frequency table such as is shown in Table 13 for 214 boys in English, then, shows how all the data were tabulated. The coefficient obtained from such a table shows the relation between the rankings in preference given by the pupils for the subject and their grade rank, as it was made up from their grades in the subject.

The formula used was $C = \sqrt{\frac{S-N}{S}}$ where $S = \Sigma\left(\frac{(N_{pq})^2}{\frac{N_p N_q}{N}}\right)$[1]
Briefly, the latter formula represents the comparison of the actual distribution of measures with the chance distribution which is gotten by that part expressed by $\frac{Np\ Nq}{N}$. This is then divided into the square of each number in the surface of actual distribution; the sum of the quotients is S. C is the coefficient of correlation obtained from the formula as it is indicated.

In some schools, boys' and girls' rankings were used together to get a sufficiently large number of cases. In such instances, the comparison that is of most interest to us is that be-

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[1] William Brown: The Essentials of Mental Measurement, p. 67.

tween the subjects of study. Where the numbers secured justified a correlation of boys' and girls rankings separately, the correlation coefficient furnishes a chance for an additional comparison of achievement in the two sexes. The following data show the results obtained.

Correlation Coefficients showing Relation between Preference of High School Pupils for their Subjects of Study and Their Achievement as shown by their Grade Rank in Those Subjects.

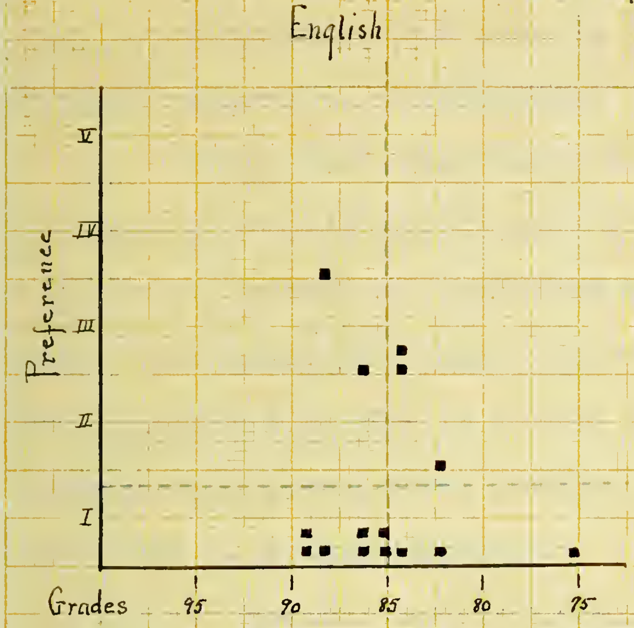
School	Subject Investigated	Number of Cases	Coefficient
B	English	62 boys and girls	.606
S_1	English	53 boys	.62
		66 girls	.58
	Algebra	26 boys	.416
		29 girls	.795
M	English	54 boys	.57
		89 girls	.77
	Algebra	40 boys	.485
		38 girls	.667
	Geometry	38 boys and girls	.728
O	English	88 boys	.513
		81 girls	.509
	Algebra	62 boys	.47
		55 girls	.16
	Geometry	46 boys and girls	.493
	Latin	74 boys and girls	.534
S_2	English	214 boys	.45
		227 girls	.497
	Algebra	89 boys	.657
		68 girls	.458
	Latin	81 boys	.567
	Mechanical Drawing	62 boys	.47
	German	89 boys and girls	.508
	Commercial Arithmetic	68 boys and girls	.656
	Bookkeeping	75 boys and girls	.562
	Domestic Science	107 girls	.54
U	English	127 boys	.57
		145 girls	.44
	Algebra	62 boys	.509
		61 girls	.677
	Geometry	34 boys	.606
		43 girls	.612
	Latin	30 boys	.689
		38 girls	.636
	German	33 boys	.624
		56 girls	.579

School	Subject Investigated	Number of Cases	Coefficient
U	Ancient History	37 boys	.705
		35 girls	.574
	Manual Training	29 boys	.77
	Domestic Science	27 girls	.745
	History (all divisions combined)	91 boys	.443
		85 girls	.528
	Physiography	30 boys	.512
		40 girls	.601

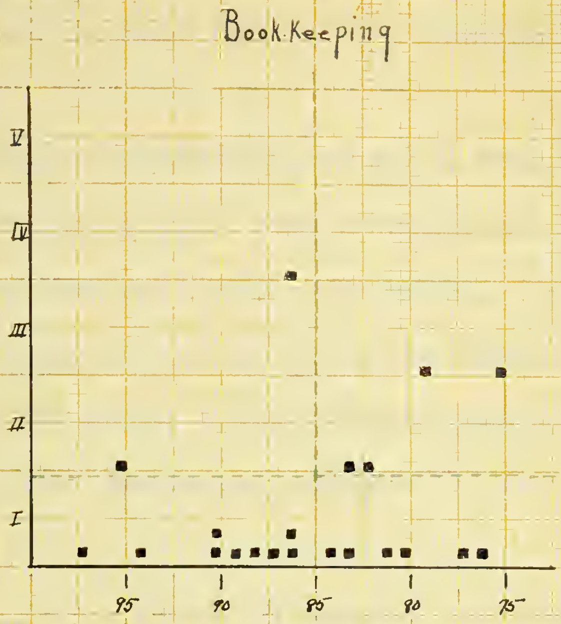
From these figures it can be seen there is a positive relation between preference as it is expressed for the subjects of study and the grades made in them. Tables 14 and 15 will help to show how the cases were distributed in one school in English and in another in bookkeeping. In the case of the 62 boys and girls represented by the first correlation in English, 15, or nearly one-fourth of the cases made their highest grade in English and ten, or two-thirds of these were first in preference as well as in grade rank. The median preference for the group of pupils in grade rank one was first in preference. The highest grade was 89, the median, 85, and the lowest was 75. Out of this group, the median for those whose grades in English were in grade rank two, was 84; the next lowest grade rank had a median of 84, and the fourth, that of 75. The median preference for these grade ranks were second, third, and fourth respectively. This shows the tendency to agreement between the rankings of preference and rankings by school marks.

In the group in Bookkeeping in school S_2, 23 of the 75, or nearly one-third made their highest grades in Bookkeeping and fifteen of these were both first in preference and first in grade rank. The highest grade was 97, made by one girl; the median, 85; and the lowest, 75.

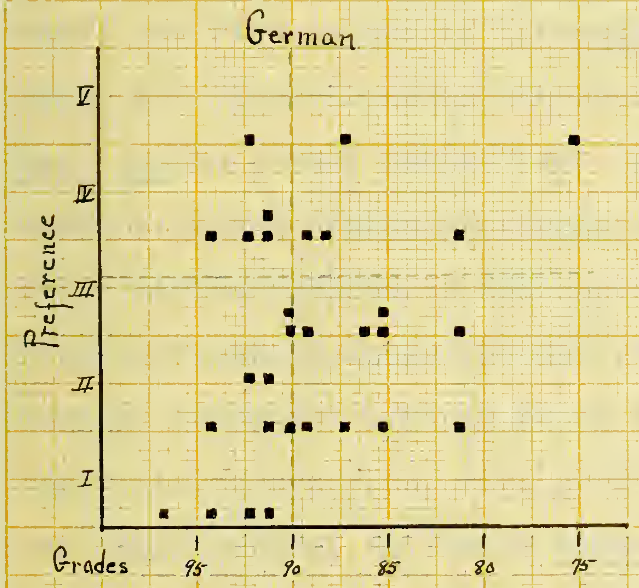
Distribution of Pupils' Preferences Throughout their Highest Rank in Achievement, or in Grade Rank One.



School B Figure 36 Boys & Girls



School S₂ Figure 37 Boys & Girls



School S₂ Figure 38 Boys & Girls

Figures showing those pupils whose highest grades have been in English, Book-keeping, and German respectively. The dotted lines show the location of the median preference—horizontal line,—and the median grade—vertical line—for the entire rank known as grade rank one. The small squares represent the pupils located at those points and are those who stand in this rank order out of 62, 75, and 89 cases respectively. For example, 15 pupils out of 62 in English are in first rank in achievement; of these 10 are above the median preference and 5 below. Of those above the median preference, 5 are above the median grade, 2 are at the median, and 3 below. Of those below the median preference, 2 are above the median grade, and 3 below.

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does not seem from this that it can be said that girls struggle without returns in mathematics.

Boys in Latin show a higher correlation than in Mechanical Drawing, a subject involving motor skill. The closer relation in Latin may possibly be explained by the fact that the school from which this group was taken has emphasized greatly in the last year the *Laboratory Method* in Latin. This would likely cause greater interest and more marked results. The remaining figures of the table are self explanatory.

A graphic representation of a group of pupils who made their best grade in English and of a group who made their highest grade in Bookkeeping, is shown by Figures 36 and 37. That is, the pupils in *grade rank one* in each subject are arranged in position with regard to the *median preference* corresponding to that grade rank, and with regard to the *median grade* assigned in the grade rank. The lines in green intersecting divide the area of *grade rank one* into four parts, viz., above both medians, below both medians, above median preference and below the median grade, and below median preference and above the median grade. A reading of Figure 36, which shows the distribution of boys and girls in English in school B would be as follows: in the part below the horizontal green line, five pupils are *above* both medians, two *at* the median grade, and three *below*, making a total of fifteen who are *above* the median preference related to the given grade rank. Above the horizontal green line, two are *above* the median grade and *below* the median preference, and three are *below* in both. Figures 37 and 38 show the same arrangement for Bookkeeping and for German and are similarly interpreted.

In this comparison, Bookkeeping shows a slightly greater proportion of pupils in grade rank one and above the median preference than English does. One can see by the number of cases below the horizontal dotted line (Figures 36 and 37) the proportion of the entire number who received their highest grade in either subject. These groups were in different schools; a number of factors would need to be considered before concluding that Bookkeeping will show this contrast with English for all similar groups of pupils.

A fairer comparison is found between the pupils in grade rank one in German and those in the same grade rank in Bookkeeping. The grouping of the pupils who are both in grade rank one and above the median preference in that grade rank is shown in Figure 38. Again, Bookkeeping is slightly the better in showing first in preference and first grade rank concurring with each other.

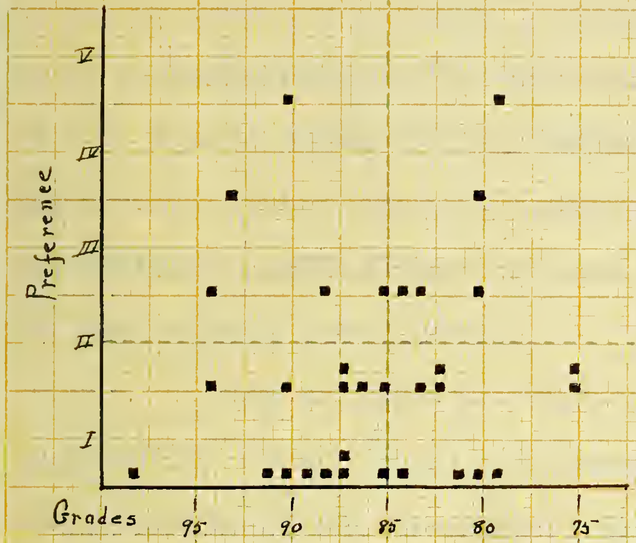
It would take more time and space than can be used here to explain all of the groups in this way. It seems that these subjects particularly admit of comparison, as English is a prescribed subject, while Bookkeeping and German are elective in most cases. That they are unlike in content affords another means of contrast. The examination of the results in these cases alone does not justify saying that a subject such as Bookkeeping will always show the higher relation between preference and achievement; it does so in this instance.

From the table it may also be noted that in three out of five schools, the relation between preference and achievement in English is slightly higher for boys than for girls while for Algebra the case is reversed. Boys show higher correlation than girls in Latin and German, while girls are higher than boys in Geometry. It

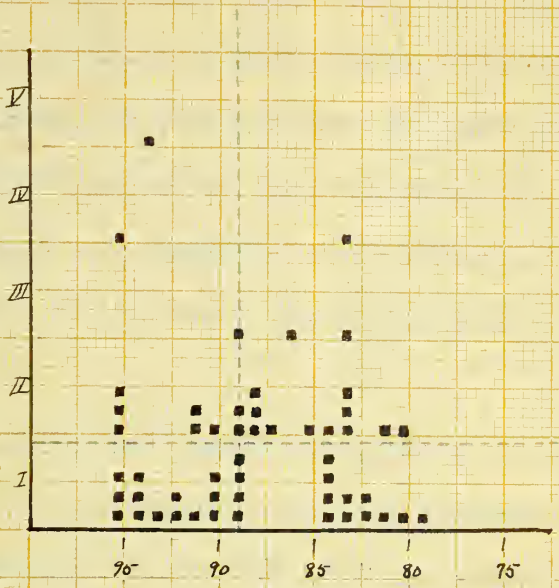
Figures 39 and 40 show a similar distribution of 33 boys and 56 girls who made their highest grade in English. Of the boys, twelve are above both medians, nine above the median preference and below the median grade, while two are at the median grade but above the median preference. Above the line representing the median preference, and consequently lower in rank, there are four above the median grade, five below in both and one at the median grade. It will be noted that the median preference for boys does not fall in as high a rank of preference as that of the girls in this subject. These diagrams indicate that in a given grade rank the pupils above the median preference corresponding to that grade rank are greater in number than those below the median preference. A high degree of achievement, then, is accompanied by high preference.

It would have been to the point to find the relation between preference and achievement in the different subjects of study with the group of 120 pupils from schools U, S_2, and M who were used as a check on permanence of preference. The chief obstacle to this was that from a random selection made from three schools differing in programs of study, not enough cases could be gotten in any one subject to insure a fair distribution. Their preferences and grades, however, have been included in the correlation of the preference and achievement of the entire group in schools U, S_2, and M. In addition to this, the comparison of their reports of preference for the subjects in their program, taken as a whole, with the rank to which their grades in each subject entitled them shows a further indication of the concurrence of preference and achievement. In Figures 41 and 42 are represented all the preferences and the corresponding rank in the subjects for the 54 boys and 66 girls

Distribution of Preferences of Boys and of Girls in Grade Rank One in English.



School S_2 Figure 39 Boys



School S_2 Figure 40 Girls

Figures showing distribution of boys and girls who stand at first rank in English. The small squares show the position of each pupil in the grade rank with to the median preference and the median grade. These are the pupils first in rank in English out of 214 and 227 cases.

Distribution of Preferences of 120 Pupils throughout their Entire Program of Studies

$r = .743$

$r = .544$

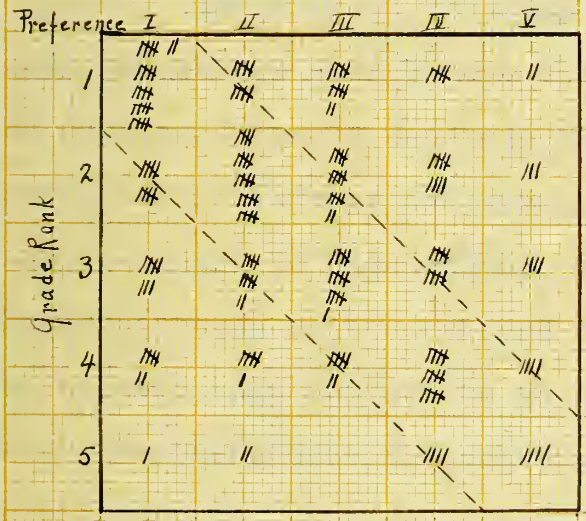


Figure 41 Boys

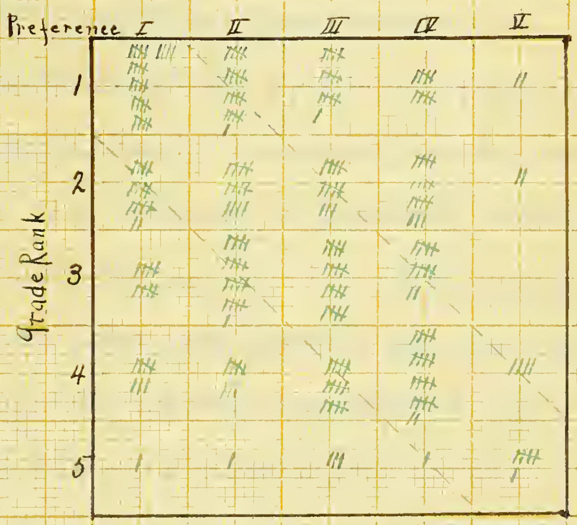


Figure 42 Girls

Figures showing preferences in all the subjects of study in the programs of 54 boys and 66 girls together with the corresponding rank for each preference as indicated by their grades in the subjects. The number of cases — 120 in all — represents the pupils whose second ranking of their subjects of study was used as a check on permanence of preference.

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who ranked the subjects the second time. That is, for every study taken by each pupil there is here recorded a preference with the rank corresponding to it. The massing of the replies in that part of the square between the diagonal lines shows the tendency to agreement between rank in preference and rank in achievement. The correlation coefficient for boys is .743; that for girls.544. This is the Pearson coefficient.

That no negative correlation has appeared points to the probability of the relation between preference and achievement being positive in all instances. That it is fairly high is indicated by the coefficients found here. In the one instance, that of school O, the correlation in Algebra is low. The number of cases there was not so small as in a few other instances, but they were so scattered as to indicate no close relation.

In general, it seems safe to say that preference and achievement are concurrent, and that indications point to preference as a factor greatly determining accomplishment in school work. How much that preference is permeated by the various influences thrown about a pupil in high school, we cannot declare with a final word. From the study of the factors entering into preference, we are led to believe that the use to be made of the subject has much to do with the preference and consequently with the attainment of the pupil.

SUMMARY.

The investigation has carried on further what has been done in regard to preference in general. That is to say, it has found what subjects are generally ranked first in preference and last in preference. It has found what subjects occupy an intermediate position. The order of precedence for subjects when ranked on basis of the number of pupils assigning them to first, second, third, fourth, and on to last rank in preference agrees in general with the previous study of Brown and Minnick.

English, Mathematics, particularly Algebra, Physics and Chemistry usually appear high in ranking. Of the subjects offering a value in a special vocation or business, Shorthand, Domestic Science and Manual Training are most often named as high in preference. History, except that of the pupil's own country is generally low in ranking. American History takes precedence in most cases over other divisions of the subject of history. The languages such as Latin and German occupy an intermediate position along with History. French and Spanish are low in ranking where they are included in the program. The subjects lowest in ranking are usually those of a specialized science as Physiology, Physiography, and Zoology, or some with a utility value in business, vocation, or a profession, such as Commercial Arithmetic, Commercial Geography, and most often Typewriting. Civics is usually low in ranking.

Reasons given as a basis for judging subjects are found generally to be those of utility, whether it be that applied to practical achievement or to the mastery of other subjects. Liking or disliking the subject without giving a basis for the like or dislike is quite often the case. It is the belief of the writer

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

that if this group of pupils were questioned this reason would be resolved into other reasons for which we have a more tangible basis. This could be done by taking time to interview the pupils. The questionnaire could make only an impersonal inquiry.

The permanence of preference together with the indications of the attitudes of the pupils toward the subjects shows that we would not be following a will-of-the-wisp preference if we should attempt to reorganize certain subject matter in order to make it better adapted to pupils' needs. Alteration in the method of presentation would be justified in order to make some subjects appeal more strongly, or to remove difficulties which pupils invariably find.

Preference and achievement have a positive relation existing between them and in most cases it is sufficiently high to insure reliability. A greater number of cases in a given subject is needed to insure that where a certain degree of achievement is discernible it is attended by a corresponding degree of preference. Certain variable factors, such as differences in marking systems, and character of the work included in a given subject in which the pupil is to give evidence of achievement, need to be eliminated or reduced to a measurable quantity in order to be more certain of the exact influence of preference.

No appreciable difference in the relation between preference and achievement is found between subjects that are highly academicized and those that are not. The facilities for achievement evidently lie outside of the inherent characteristics of the subjects themselves. If any contrast be more marked than others, it is that between the achievement of boys and girls in the same

subject.

The study, as a whole, gives a validity to preference as expressed by high school pupils, and offers the beginning for a more minute investigation of the relation of preference to achievement. Supplementary studies which would be valuable would be those in connection with the marks representing achievement and the peculiar organization and presentation of subjects from which achievement records are taken.

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